239

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

CONTENTS

TRADE NAME	MODEL	SET AND FOLDER No.
Arvin	7210CB-UHF, CM-UHF, 7212CFP-UHF, MEA-UHF, 7214CM-UHF, 7216CB-UHF, 7218CB-UHF, CM-UHF, 7219CM-UHF (Ch. TE341-3, -4, -5, -6, -41) Tel. Rec. Prod. Chg. Bul. 94	239-1
Craftsmen	500A	239-2
Crescent	900 Series Recorder	239-3
Crest	10A, 10B UHF Conv.	239-4
Dewald	H-527	239-5
Magnavox	108, A Series Tel. Rec.	239-6
Raytheon	UC-2139A, UC-2141A, UC-2142A, UC-2144A, UC-2145A, UM-2133A, UM-2134A, UM-2135A, UM-2136A (Ch. 21T8) Tel. Rec.	239-7
Sentinel	1U-532, A, 1U-542, A, 1U-552, 1U-554, 1U-562, 1U-564 Tel. Rec.	239-8
Silvertone	3001, 3002 (Ch. 132.054)	239-9
Truetone	D1435A, D1436A	239-10
Westinghouse	H417T5, H418T5 (Ch. V-2186-1)	239-11
Zenith	L2259E, EU, R, RU, L2260R, RU, L2261E, EU, H, HU, L2266R, RU, L2267E, EU, H, HU, L2270, U (Ch. 21L21), L2287R, RU (Ch. 21L21 & Radio Ch. 10L20) Tel. Rec.	239-12

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 4 IN SET 188

Arvin Ch. TE341 and TE341-1 were covered in Photofact Folder 4, Set 188. Chassis TE341-2 was added with Production Change Bulletin 63, Set 197-1. Later production changes are given below.

Ch. TE341-3

Chassis TE341-3 is identical to Ch. TE341-2 except for the following:

TO INCREASE THE DRIVE OF THE VIDEO AMPLIFIER

R52 was changed from 3.9KΩ to 2.7KΩ.

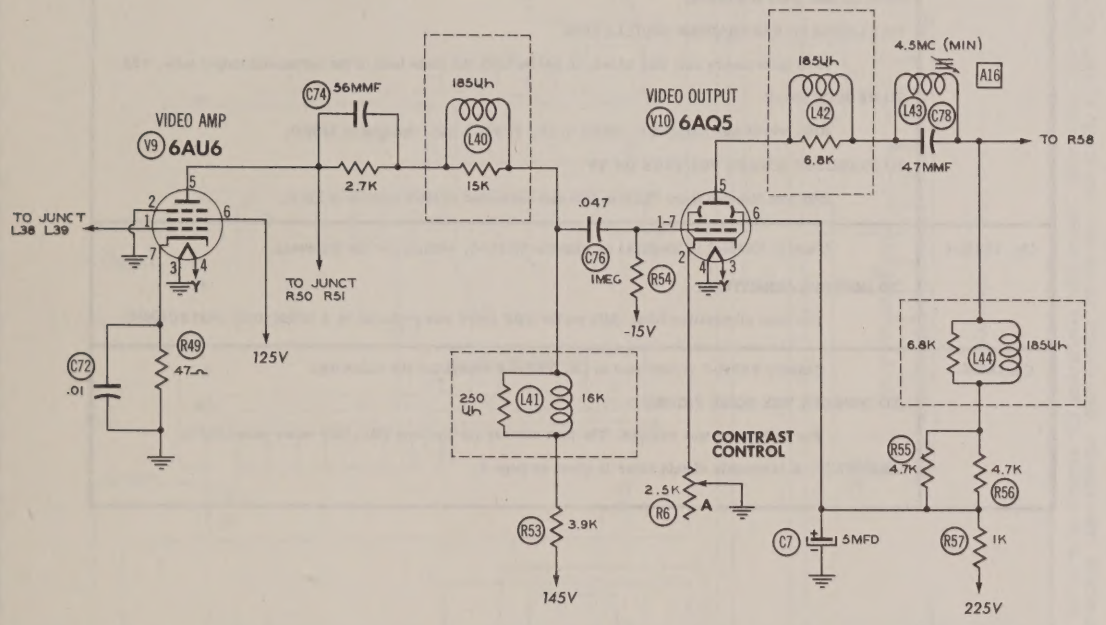
R53 was changed from 2.7KΩ to 3.9KΩ.

L40 was changed to a 185 microhenry coil, wound on a 15KΩ resistor.

L41 was changed to a 250 microhenry coil, wound on a 16KΩ resistor.

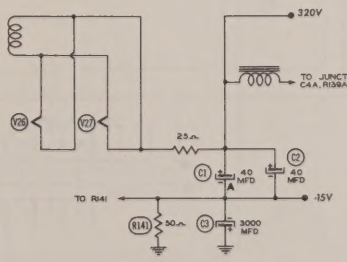
C75 and C77 were deleted,

A partial schematic, showing the revised circuit is given below.



TO LIMIT THE PEAK CURRENT IN THE 5U4 TUBES

A 25Ω, 14 watt resistor was added between the cathodes of V26 and V27 and the junction of C1A and C2A. The 320V line and L1 were then connected to the junction of C1A and C2A as shown in the partial schematic below.



ARVIN MODELS 7210CB-UHF, 7210CM-UHF, 7212CFP-UHF, 7212MEA-UHF, 7214CM-UHF 7216CB-UHF, 7218CB-UHF, 7218CM-UHF, 7219CM-UHF (Ch. TE341-3, -4, -5, -6, -41)

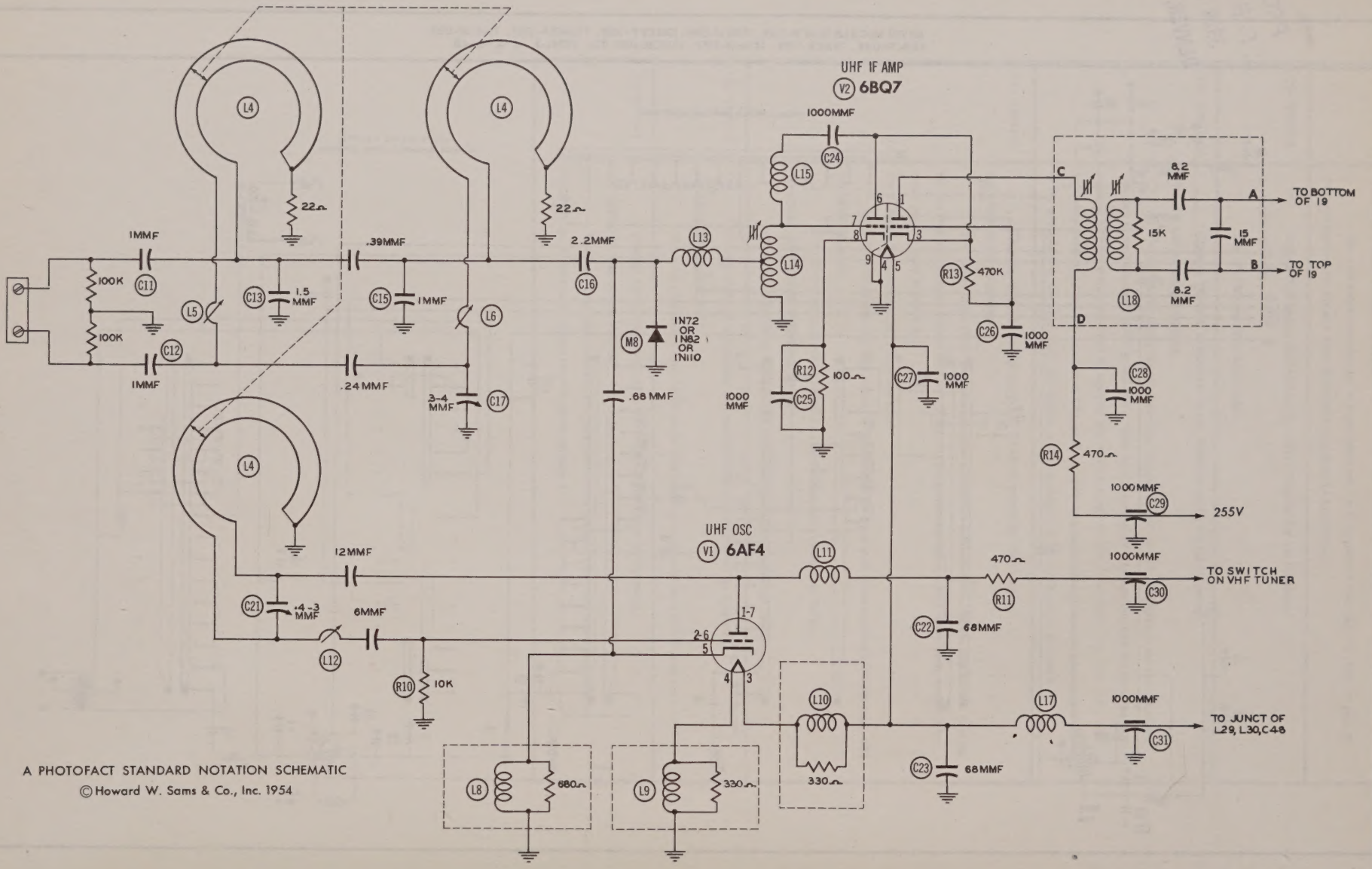
PROPERTY OF
L. F. BLANKENSH...
3924 MEADE ST.
DENVER, COLORADO

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1954 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

	CASCODE TUNER INCORPORATED The VHF tuner was changed to a cascode type. A schematic of this tuner is given on page 3. The part number for the new VHF-UHF tuner assembly is AE25267-6.
Ch. TE341-4	Chassis TE341-4 is identical to Ch. TE341-3 except for the following: TO REDUCE SNOW The IF-FM trap (M4) was deleted.
Ch. TE341-41	Chassis TE341-41 is identical to Ch. TE341-4 except for the following: PROCUREMENT DIFFICULTIES The horizontal output transformer was changed to part number E24989 and the width coil was changed to part number C24991 (green dot). This horizontal output transformer does not have the AGC winding between terminals 2 and 6, however the width coil has an AGC secondary. The lead which was formerly connected from the junction of C85, R117 and R118 to terminal 6 of T3 is now connected to the top of the secondary of the width coil. The bottom of the secondary of the width coil is grounded.
Ch. TE341-5	Chassis TE341-5 is identical to Ch. TE341-41 except for the following: PICTURE TUBE CHANGED The picture tube (V28) was changed from a 21MP4 to a 21AP4 tube. When this change is made the ion trap was changed to part number C25662-3. The centering magnet (M10) was, also, replaced by focus magnet (part #C23910-2). TO ELIMINATE BARKHAUSEN OSCILLATION A 93 microhenry coil was added, in series with the plate lead of the horizontal output tube, V23. TO REDUCE SNOW R93, which was changed to 470KΩ in Ch. TE341-2 was changed to 220KΩ. TO STABILIZE SCREEN VOLTAGE ON V8 R46 was changed from 33KΩ to 1KΩ and connected to 145V instead of 225V.
Ch. TE341-6	Chassis TE341-6 is identical to chassis TE341-5, except, for the following: TO IMPROVE SENSITIVITY The band elimination filter (M5) on the VHF tuner was replaced by a 127MC trap (part #C40916).
Ch. TE341-7	Chassis TE341-7 is identical to Ch. TE341-6 except for the following: TO IMPROVE THE NOISE FIGURE The UHF tuner was revised. The part number for the new VHF-UHF tuner assembly is AE25267-10. A schematic of this tuner is given on page 4.

ARVIN MODELS 7210CB-UHF, 7210CM-UHF, 7212CFP-UHF, 7212MEA-UHF, 7214CM-UHF, 7216CB-UHF, 7218CB-UHF, 7218CM-UHF, 7219CM-UHF (Ch. TE341-3, -4, -5, -6, -41)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

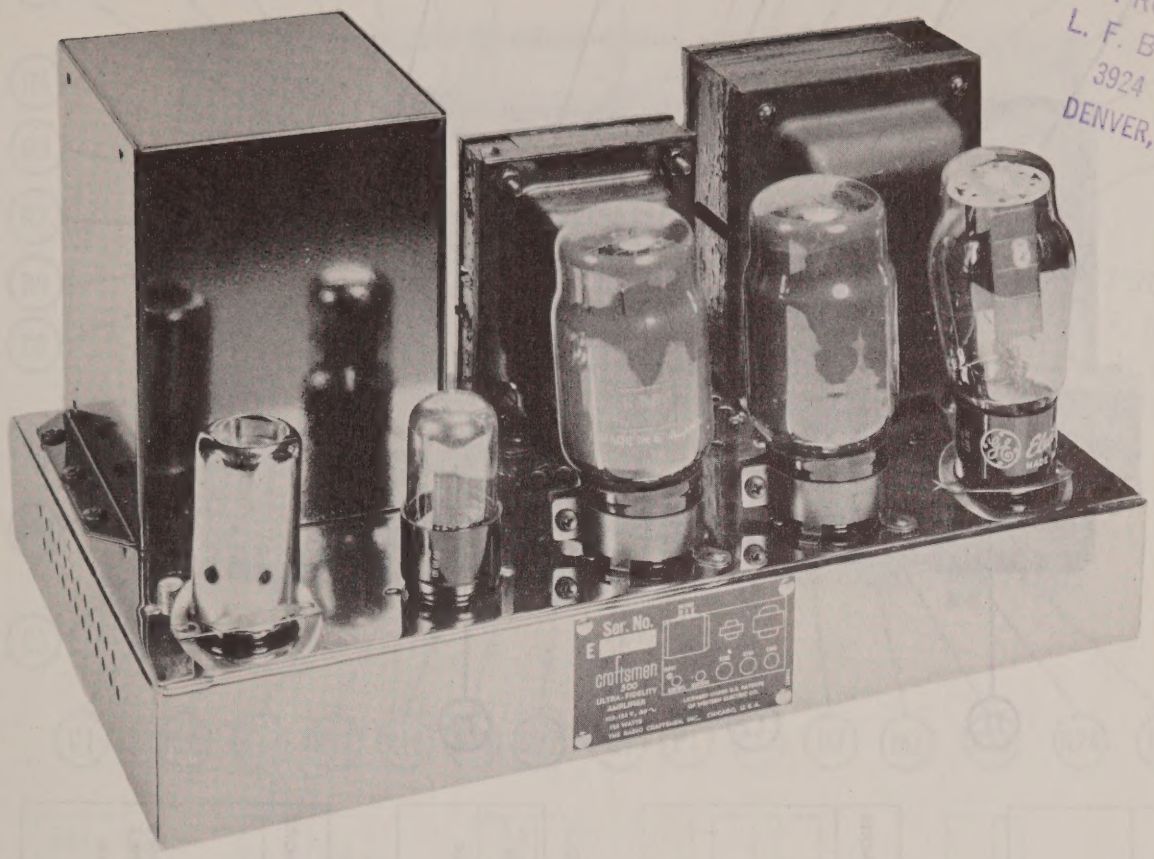


A PHOTOFACT STANDARD NOTATION SCHEMATIC

©Howard W. Sams & Co., Inc. 1954

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

RADIO CRAFTSMEN
MODEL 500A



RADIO CRAFTSMEN
MODEL 500A

TRADE NAME	Radio Craftsmen Model 500A
MANUFACTURER	Radio Craftsmen, Inc., 4401 N. Ravenswood Ave., Chicago 40, Ill.
TYPE SET	AC Operated Power Amplifier For Custom Installations
TUBES (Five)	Types 6SN7GTA AF Amp.-Phase Inverter, 6SN7GTA Driver, (2) KT66 Audio Output, 5U4G Rectifier
POWER SUPPLY	105-125 Volts AC-60 Cycles RATING 1.22 Amp. @ 117V

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1954 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

RADIO CRAFTSMEN
MODEL 500A

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		CRAFTSMEN PART No.	STANDARD REPLACEMENT		
V1	AF Amplifier Phase Inverter	6SN7GTA	6SN7GTA	8BD	
V2	Driver	6SN7GTA	6SN7GTA	8BD	
V3	Audio Output	KT66	KT66	7S	For optimum operation, output tubes should be a matched pair.
V4	Audio Output	KT66	KT66	7S	
V5	Rectifier	5U4G	5U4G	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	CRAFTSMEN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	▪40	500	18S033	AFH2-72		C041				
B	■40	500		AFH2-67		BR850				
C	▲8	500								
D	8	500								
C2	560	500	CM20A561J			1R5T56				
C3	.47	400	CP10M4474M	P488-47		CUB4P47		PT4047	4TM-P47	
C4	.47	400	CP10M4474M	P488-47		CUB4P47		PT4047	4TM-P47	
C5	.1	400	CP10M4104M	P488-1		CUB4P1		PT401	4TM-P1	
C6	.1	400	CP10M4104M	P488-1		CUB4P1		PT401	4TM-P1	
C7	.22	400	CP10M2224M	P488-22		CUB4P22		PT4022	4TM-P22	
C8	68	500	CM20A680J			22R5Q68				

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	CRAFTSMEN PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	100Ω	2	23S801	W-100	A43-100	VK-121	R100L	Hum balance - wire wound
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R1A
R2A	100Ω	2	23S802	W-100	A43-100	VK-121	R100L	Bias
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R2A

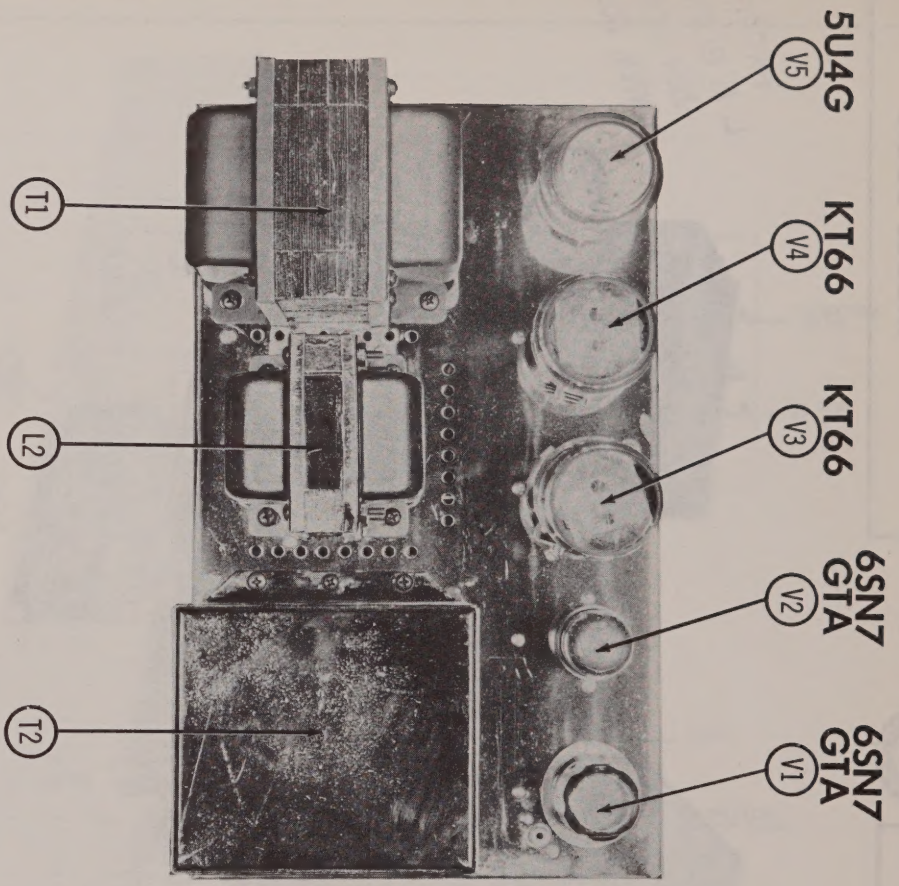
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	CRAFTSMEN PART No.	IRC PART No.	
R3	470KΩ	1/2	RC20AE474K	BTS-470K	
R4	470Ω	1/2	RW0471J	BTS-470	
R5	2700Ω	1/2	RC20AE272J	BTS-2700	
R6	47KΩ	2	RC40E473K	BTB-47K	
R7	22KΩ	1	RC30AE223KB	BTA-22K	Note 1
R8	22KΩ	1	RC30AE22KB	BTA-22K	Note 1
R9	5100Ω	1/2	RC20AE512J	BTS-5100	
R10	470KΩ	1/2	RC20AE474K	BTS-470K	
R11	390Ω	1/2	RC20AE391K	BTS-390	
R12	470KΩ	1/2	RC20AE474K	BTS-470K	
R13	100KΩ	2	RC40AE104KB	BTB-100K	Note 2
R14	100KΩ	2	RC40AE104KB	BTB-100K	Note 2
R15	100KΩ	2	RC40AE104KB	BTB-100K	
R16	100KΩ	2	RC40AE104KB	BTB-100K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	CRAFTSMEN PART No.	IRC PART No.	
R17	100KΩ	1/2	RC20AE104K	BTS-100K	
R18	100KΩ	1/2	RC20AE104K	BTS-100K	
R19	100Ω	1	RC30AE101K	BTA-100	
R20	100Ω	1	RC30AE101K	BTA-100	
R21	1000Ω	1/2	RC20AE102K	BTS-1000	
R22	100Ω	1/2	RC20AE101K	BTS-100	
R23	400Ω	5	RW5401GB		Note 3
R24	400Ω	5	RW5401GB		Note 3
R25	1000Ω	1/2	RC20AE102K	BTS-1000	
R26	100Ω	1/2	RC20AE101K	BTS-100	
R27	47KΩ	10	RW10473K		
R28	33KΩ	2	RC40AE333K	BTB-33K	
R29	22KΩ	1	RC30AE223K	BTA-22K	
R30	22KΩ	1/2	RC20AE223K	BTS-22K	

Note 1. R7 and R8 are a matched pair ± 1%.
Note 2. R13, R14, R15, and R16 are matched ± 1%.
Note 3. R23 and R24 are a matched pair ± 1%.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	CRAFTSMEN PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC 1.22A	1128VCT .150ADC	5VAC @ 3A	6.3VCT @ 3.9A	19S218	PC-8414 ① ②				T-22R36

① Drill new mounting holes.
② Parallel 6.3V windings.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	CRAFTSMEN PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T2	8.6KΩ CT	16Ω tap @ 8Ω	19S014	A-8054①		S-148A① ②	H4102 ①		① Drill new mounting holes. ② Tape 4Ω secondary tap.

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	CRAFTSMEN PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
L1	.02A	800Ω	21.5HY	19S409	C-1003	C-2987		C5003	
L2	.150A	180Ω	14.2HY	19S414		C3195 ①		C5034 ①	T-26C45

① Drill new mounting holes.

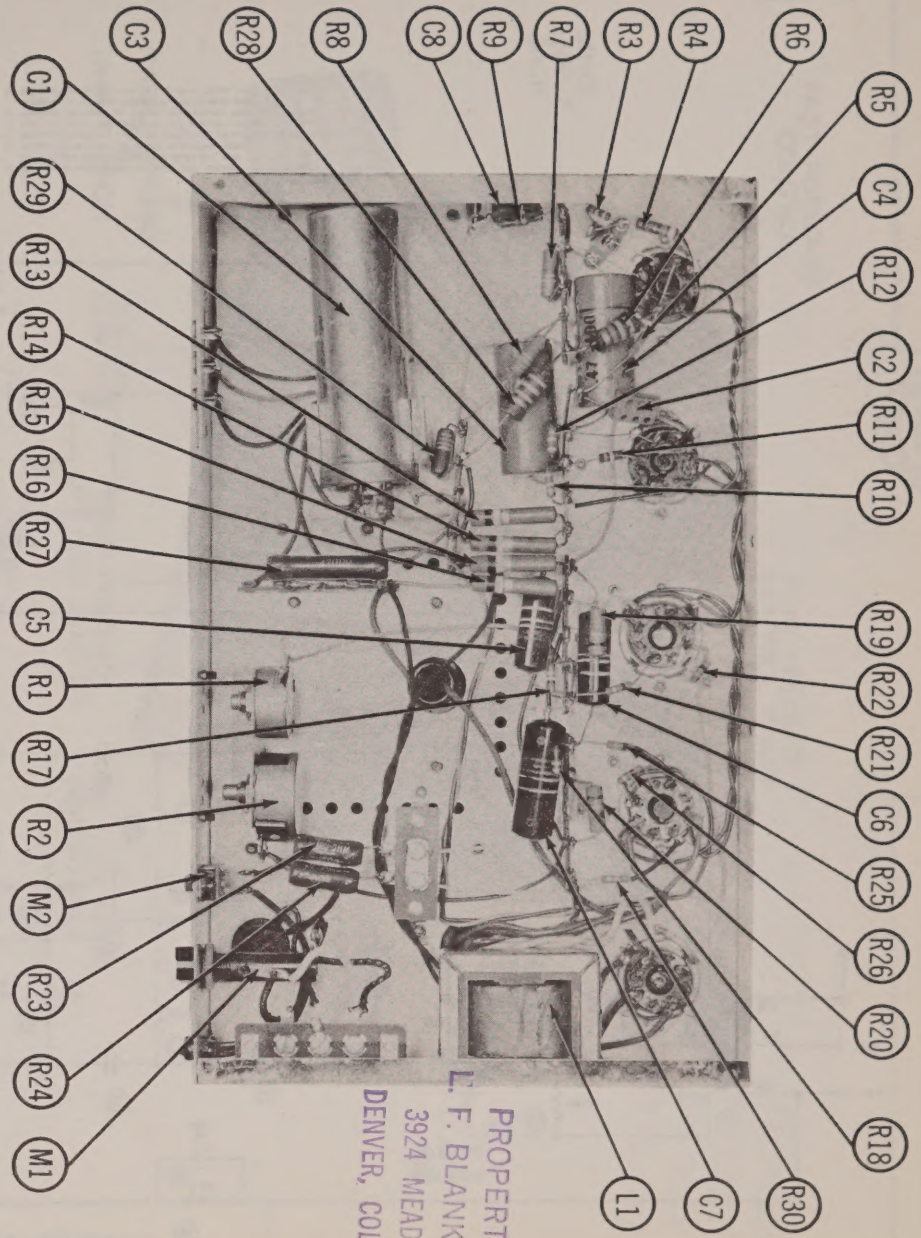
FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			CRAFTSMEN PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	3A	34X002		312003 (3AG-3A)	341001	AGC3	HKP

MISCELLANEOUS

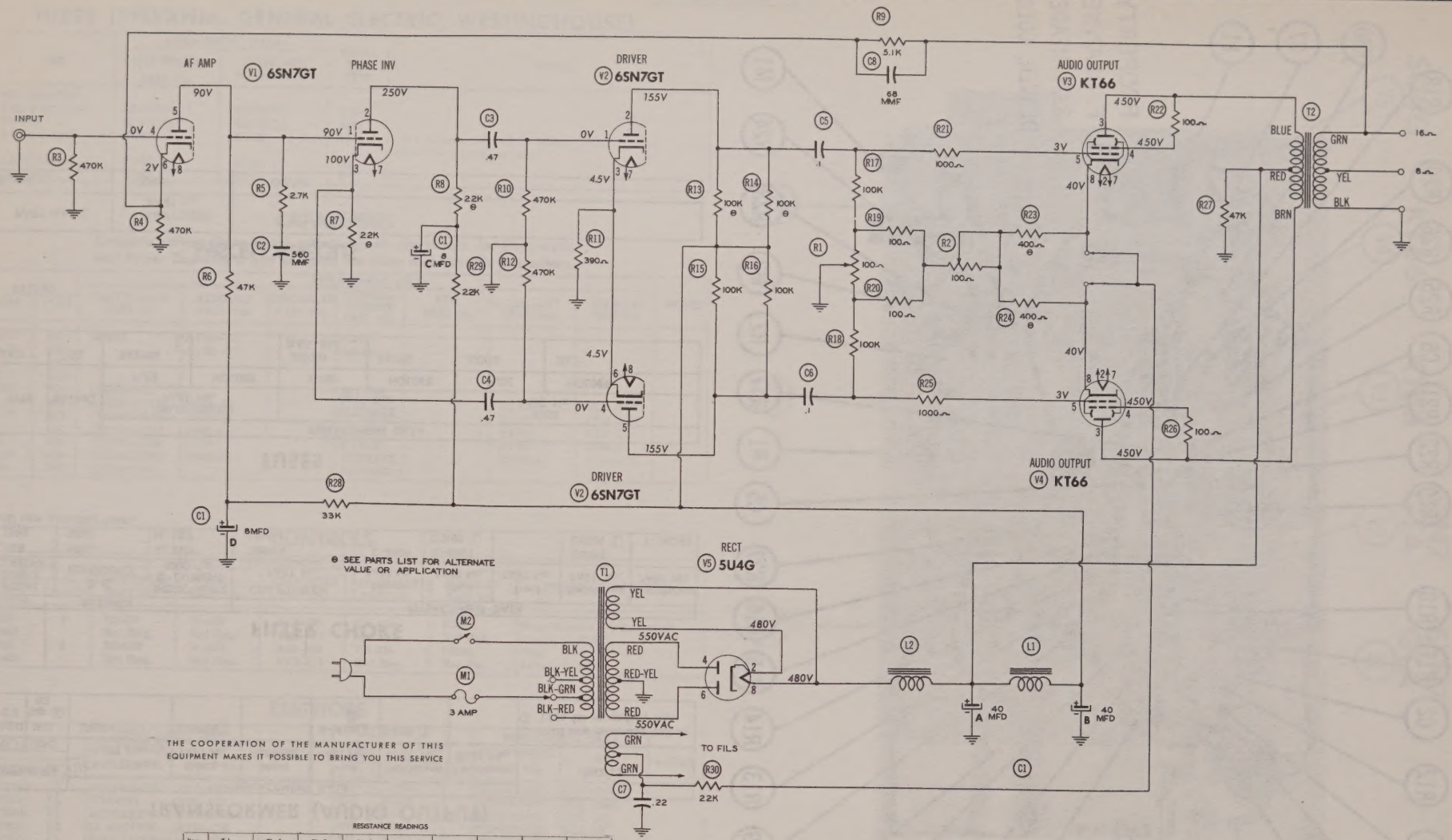
ITEM No.	PART NAME	CRAFTSMEN PART No.	NOTES
M2	Switch	4X010	Off/on

CHASSIS—BOTTOM VIEW



PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

RADIO CRAFTSMEN MODEL 500A



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6SN7GT	†80KΩ	†45KΩ	22KΩ	470KΩ	†80KΩ	420Ω	325Ω	325Ω
V 2	6SN7GT	470KΩ	†50KΩ	390Ω	470KΩ	†50KΩ	390Ω	325Ω	325Ω
V 3	KT66	0Ω	325Ω	†150Ω	†250Ω	100KΩ	INF	325Ω	325Ω
V 4	KT66	0Ω	325Ω	†170Ω	†270Ω	100KΩ	INF	325Ω	325Ω
V 5	5U4G	INF	30KΩ	INF	70Ω	INF	90Ω	INF	30KΩ

† MEASURED FROM PIN 8 OF V5.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

©Howard W. Sams & Co., Inc. 1954

PROPERTY OF
L. F. [illegible]
DENVER COLORADO

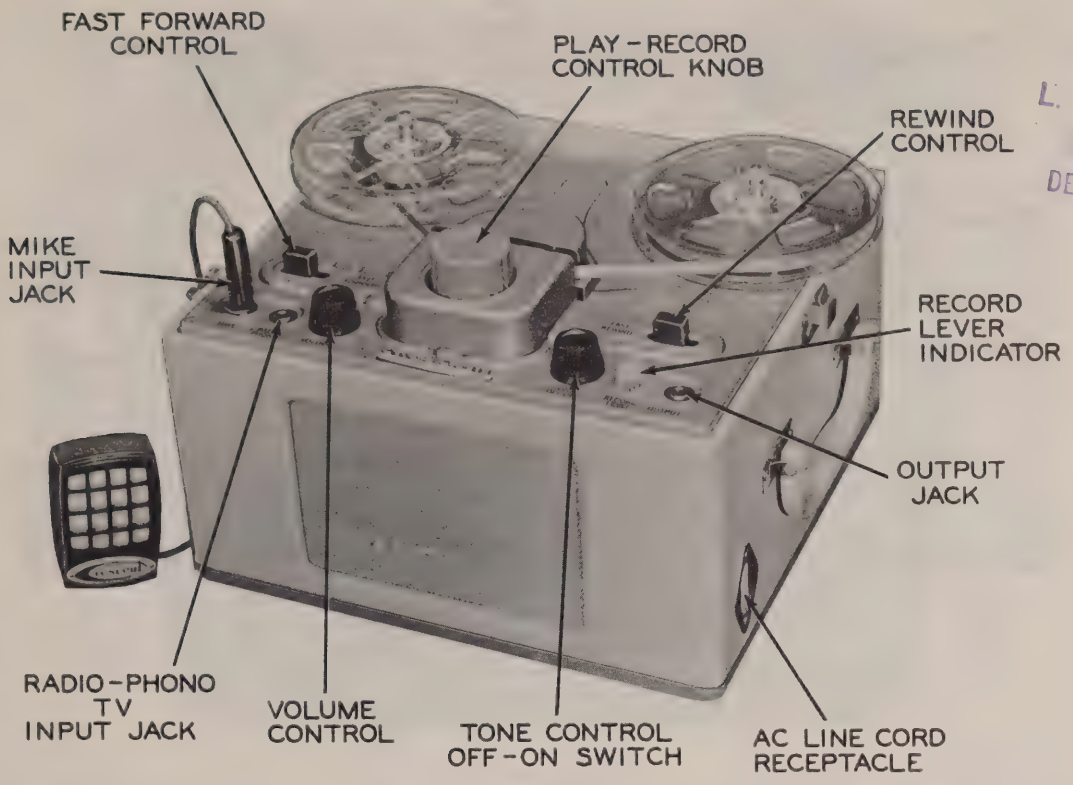


Figure 1

GENERAL INFORMATION

The Cresent 900 Series Tape Recorder is designed to record and play back two tracks of material on standard width (1/4") recording tape, which doubles the playing time of a standard 5" or 7" reel of tape with no loss of frequency response or quality. Recordings can be made from a radio, television receiver or phonograph, in addition to those made directly from the microphone. Recordings can be played back through the self-contained speaker or an external speaker through use of the Output Jack.

The Cresent Models 903 and 907 are fundamentally identical in construction, the major difference being that Model 903 has a tape speed of 3 3/4" per second while Model 907 operates at 7 1/2" per second. Using both channels of the tape, the recording time for both models is as follows:

Size Reel	Model 903 Speed - 3 3/4" per sec.	Model 907 Speed - 7 1/2" per sec.
5"	1 hour	1/2 hour
7"	2 hours	1 hour

Models 903 and 907 are designed to operate on 60 cycle, 110-120 volts, AC supply.

CAUTION: Severe Damage Will Result If Connection Is Made To A Direct Current (DC) Line.

Manufactured by:

Crescent Industries, Inc.
5900 W. Touhy Avenue
Chicago 31, Illinois

This material compiled and published by

HOWARD W. SAMS & CO., INC., INDIANAPOLIS, INDIANA

Copyright 1954 • All Rights Reserved

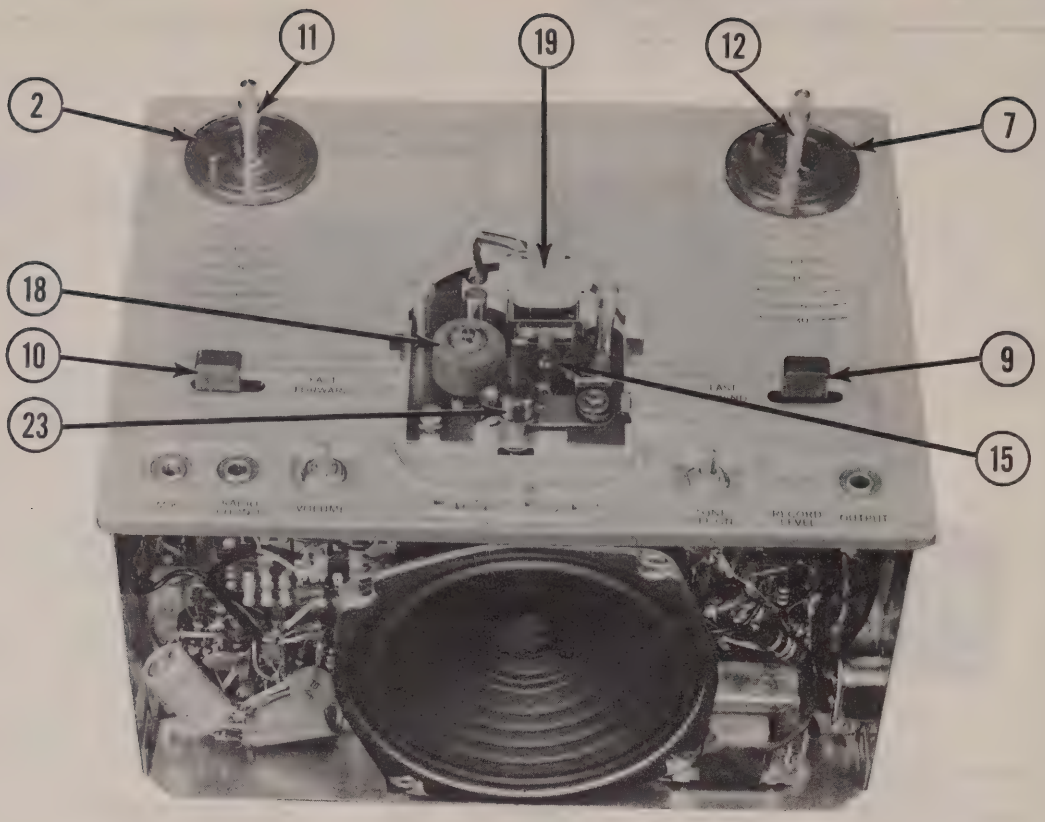


Figure 2

SPECIFICATIONS

Model 903

Fast Speed --- 5" reel - 45 sec. 7" reel - 90 sec.

Freq. Response --- 65 to 6000 cycles per sec.

Model 907

Fast Speed --- 5" reel - 45 sec. 7" reel - 90 sec.

Freq. Response --- 65 to 10,000 cycles per sec.

Model 903 & 907

Power Requirements: 110-120 volts - 60 cycle AC only @ 70 watts.

Power Output: 2 watts undistorted - 3 watts max.

Inputs: Mike - 1 Meg. Imp., Radio-Phono .5 Meg. Imp.

Outputs: Int. 5" Speaker, Ext. 3.2Ω Speaker, Ext. 1 Meg. Imp. for Ext. Amp. or Monitor in record.

Bias & Erase Freq: 50 KC.

OPERATING INSTRUCTIONS

1. With the On-Off Tone Control in the "Off" position, insert the AC power cord into the receptacle on the right side of the cabinet (Figure 1).

2. Plug the AC cord into a convenient wall receptacle of the proper rating.

Threading The Tape-

1. Place a reel of tape on the right reel plate (7) and an empty reel on the left reel plate (2) making sure the reel slots engage the pins on the reel plates.

2. Unwind about 10" of tape from the reel. Hold a section of the tape straight with both hands and insert the tape in the tape slot making sure the dull coated side faces the rear of the recorder.

NOTE: This recorder uses Type "A" wound tape, i.e. the dull magnetic coated side faces inward on the reel. If the tape used is Type "B" (coated side facing outward) the recording will be made at a very low sound level and the playback will be almost inaudible.

3. Insert the free end of the tape into one of the three radial slots in the hub of the empty reel. Turn the reel several turns, clockwise, until the tape is secured to the reel and all slack is taken up between reels.

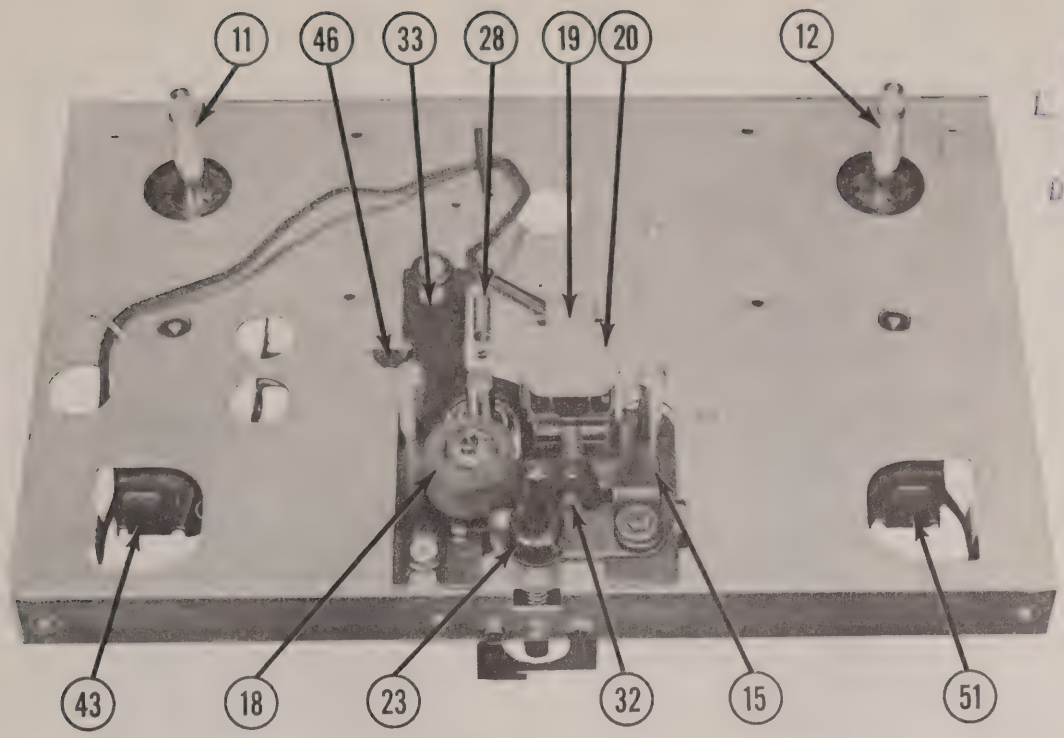
To Record From Microphone-

1. Turn the On-Off Tone Control clockwise until a click is heard and allow about thirty seconds for the tubes to warm up.

2. Insert the microphone plug into the "Mike" jack.

3. Depress the play-record control knob (4) as far as it will go, turn clockwise until it locks while holding it down.

4. Hold the microphone about six inches from your mouth and speak in a normal voice. Adjust the



PROPERTY OF
DENVER, COLORADO

Figure 3

"Volume" control until the record level indicator flashes on the loudest sounds.

NOTE: Correct recording volume is very important. Too weak a signal, which does not cause the record level indicator to flash, will result in weak playback and high background noise. Too strong a signal, causing the level indicator to flash continuously, will result in distortion during playback.

To Record From Radio-

Recordings from a radio may be made by one of three ways:

1. Place the microphone about 6" to 12" in front of the radio speaker. Turn the radio volume control to a normal level. Setting it too high will cause distortion. Turn the radio tone control to maximum treble. Set the recording level and proceed with recording as described under "To Record From Microphone". This type of recording may not be satisfactory as other sounds may be picked up by the microphone which as a result will be recorded on the tape.

2. Have a shielded cable made up with a two conductor phone plug on one end and two alligator clips on the other end. Connect the alligator clips across the voice coil terminals on the radio speaker and insert the cord plug into the "Radio-Phono" jack. Set the radio volume and tone controls as described above. Set the recording level and proceed as described under "To Record From Microphone".

3. Have a shielded cable with a two conductor phone plug on one end and the other end connected across the radio volume control. Insert the phone plug into the "Radio-Phono" jack. Set the recording level and proceed with the recording as described under "To Record From Microphone". The position of the radio volume and tone controls has no effect on this set up and may be set anywhere.

To Record From Phonograph-

1. If the phonograph being used has a phone type plug on the pickup leads, insert it into the "Radio-Phono" jack. Set the recording level and proceed with the recording as described under "To Record From Microphone".

2. If the phonograph has a standard pin type plug which is more common, an adaptor is needed. Insert the pin plug into the adaptor and plug the adaptor into the "Radio-Phono" jack.

IMPORTANT: The recorder will not record from microphone or play back while a plug is inserted in the "Radio-Phono" jack.

To Record From Television Receiver-

1. Use one of the three methods described under "To Record From Radio" and proceed with the recording as described under "To Record From Microphone".

Dual Track Recording-

The Crescent is designed so that only one-half the tape width is recorded at a time; thereby resulting in two track recording. This two track operation is accomplished in the following manner:

1. After a reel of tape has been recorded, i.e. all of the tape wound on to the take-up reel, turn the play-record control (4) to idle.

2. Remove the reels from the recorder, turning the full reel over and placing it on the right reel plate (7) and the empty reel on the left reel plate (2).

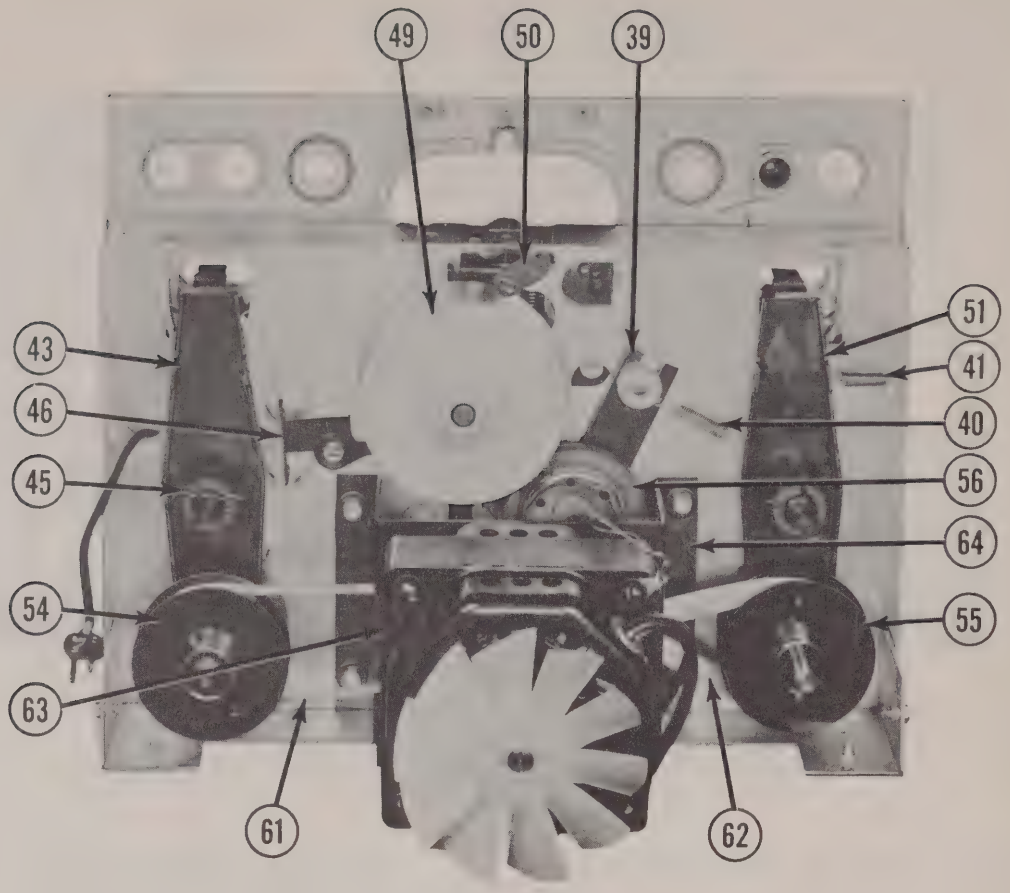


Figure 4

3. Properly thread the tape and proceed with the recording.

4. After this track has been recorded the first track of recording is ready to be played without rewinding, by reversing the reels as described in step 2 above.

Fast Forward And Fast Rewind-

High-speed forward or reverse can be obtained by pressing the desired knob (9 or 10) toward the head cover. Movement of these controls will wind the tape on the desired reel at a high speed as long as the control is held in this position. These are used primarily in locating a desired portion of a recording in a few seconds.

CAUTION: Do not attempt "Fast Forward" or "Fast Rewind" with the play-record control (4) on anything but idle position, as damage to the unit or breaking of the tape may result.

Braking-

The Crescent is equipped with a quick stop when in high speed, either direction. Move both "Fast Forward" and "Fast Rewind" controls toward the head cover and then release both at the same time. For example: when in fast forward speed, continue to hold control and with the other hand move "Fast Rewind" control toward head cover. When machine stops, release both controls at the same time. If a coasting stop is desired, release control in motion and tape will glide to a momentum stop.

To Play A Recording-

1. Thread tape as described under "Threading the Tape".

2. Turn play-record control (4) clockwise without depressing until it locks.

3. Adjust the "Volume" and "Tone" controls for desired listening level.

To Use An External Speaker-

Any size speaker of the permanent magnet type, having a 3.2 ohm voice coil, may be used by connecting an extension cord across the voice coil of the speaker and then inserting the extension plug (same type as microphone plug) into the "Output" jack. This automatically cuts out the self-contained speaker.

To Edit And Splice Tape-

NOTE: Since it is impossible to edit and splice one track without affecting the other, recordings which are to be edited should be limited to one track only.

1. The tape may be edited by cutting out unwanted portions, or by joining selections into another sequence. Announcements may be inserted between selections, etc. Unused sections of tape can be spliced together for re-use.

2. For best results, cut tape at a slight diagonal, join ends together with splicing tape on the glossy side and trim off any excessive width.

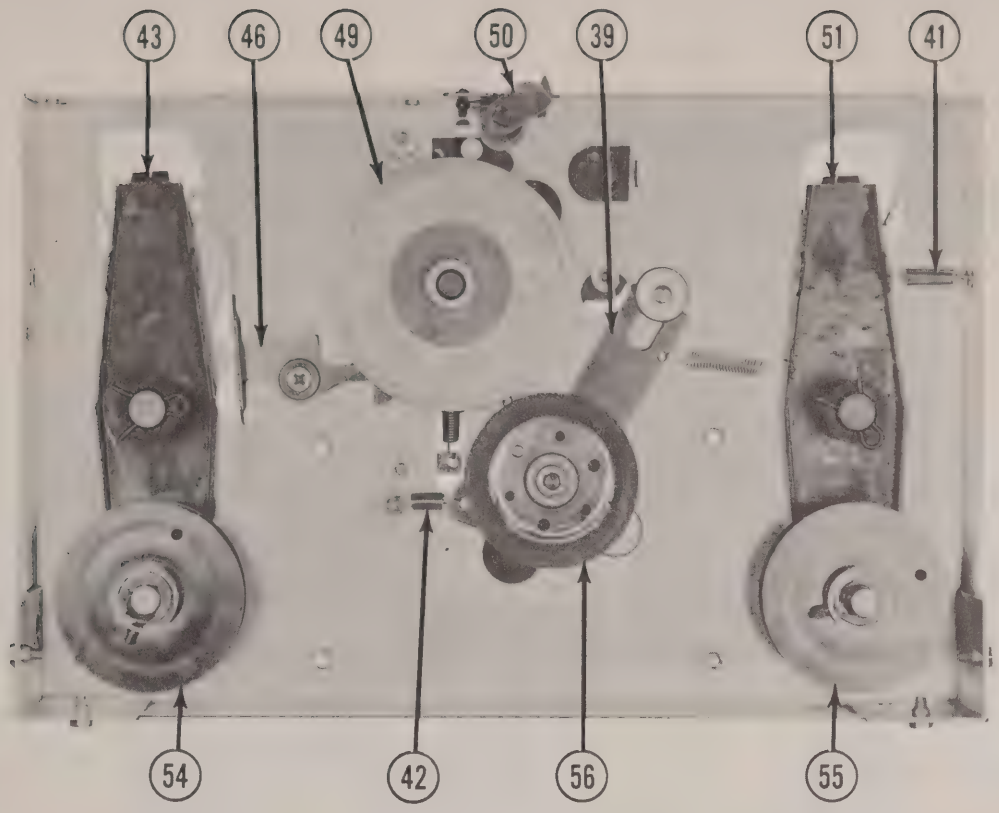


Figure 5

PROPERTY OF
L. F. BLANKENSHIP
3924 [illegible]
DENVER, COLORADO

Erasing Recorded Material-

In the record position any recording on the tape is automatically erased before a new recording is put on the tape. If it is desired to erase a recording without putting anything on the tape follow the normal recording procedure, but leave the "Volume" control set at its extreme counterclockwise position.

To Use As A Public Address System-

1. Insert the microphone plug into the "Radio-Phono" jack.

2. Leave the play-record control (4) in idle position.

3. Speak into the microphone and adjust the "Volume" and "Tone" controls for desired level.

4. Do not have the microphone too close to the speaker or a feedback howl will result.

ADJUSTMENTS

Removing Unit From Case-

All service work except cleaning of the head and pressure roller and adjustment of the head and pressure pad assembly requires removal of the unit from the carrying case.

1. To remove unit from carrying case, disconnect power cord and remove the four Phillips head screws from bottom of case and carefully lift unit straight up and out.

Spindle (11 and 12) End Play Adjustments-

The spindles should have from 1/32" to 1/16" of up and down movement. Loosen the set screw in the pulley (54 or 55) and move the pulley up or down until the correct amount of end play is obtained.

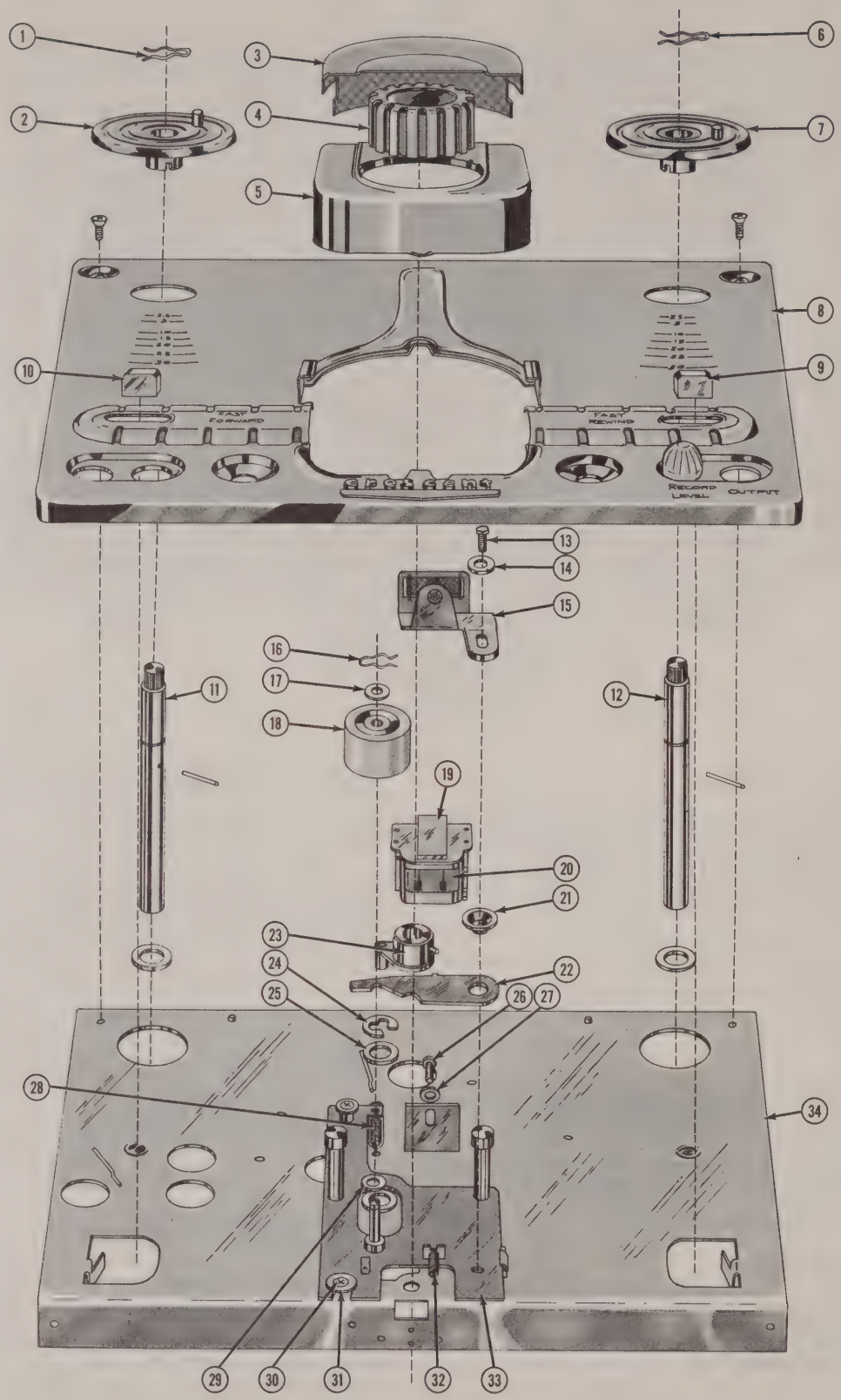
Take Up Spring (46) Adjustment-

Place a full 7" reel of tape on the take up reel plate (2). Rewind on the feed reel for about 10 seconds. Place the unit in the "Play" position. The take up reel should start revolving at the same time or a little after the capstan and pressure roller (18) start pulling tape. There should be no looping of the tape before it starts to take up. If the tape loops or doesn't take up at all, bend the take up lever spring (46) at point "A" on exploded view until the recorder takes up properly. Bending the spring outward will increase the take up while bending inward will decrease it.

CAUTION: Do not bend spring (46) to give too much take up or the tape will start to go into fast forward before the pressure roller reaches the capstan.

Take Up Reel Seat (2) And Feed Reel Seat (7) Drag Adjustment-

When the play-record control (4) is released, the reels should stop right away to prevent looping of the tape. Also when in fast forward or rewind and the control is released the reels should coast to a stop without looping the tape. The stop arms on the motorboard (point "B" on exploded view) that the take up and feed reel arms (43 and 51) rest against when the tape is not moving are what govern this. The stop arms should be bent to force the take up reel arm (43) and the feed reel arm (51) over far enough to take up enough belt tension so that the spindles just start to revolve without the reels in place. The play-record control (4) should be in its extreme counterclockwise position when making this adjustment. With the reels in place the spindles should not



A PHOTOFACT "EXPLODED" VIEW

© Howard W. Sams & Co., Inc. 1954

Figure 6A. Exploded View of Parts Above Baseplate.

PROPERTY OF
L. F. [illegible]
3024 [illegible] ST.
DENVER, COLORADO

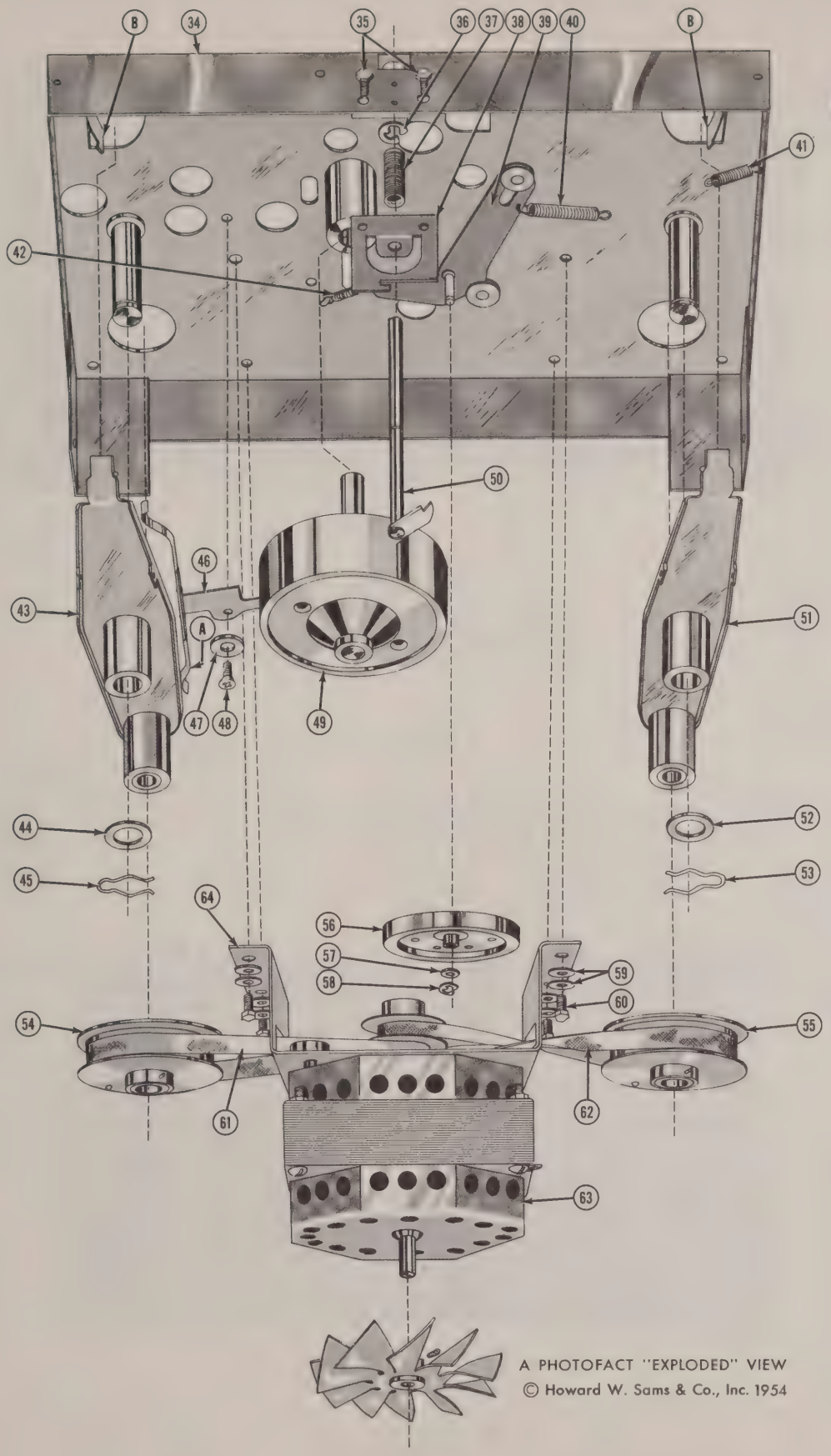


Figure 6B. Exploded View of Parts Below Baseplate.

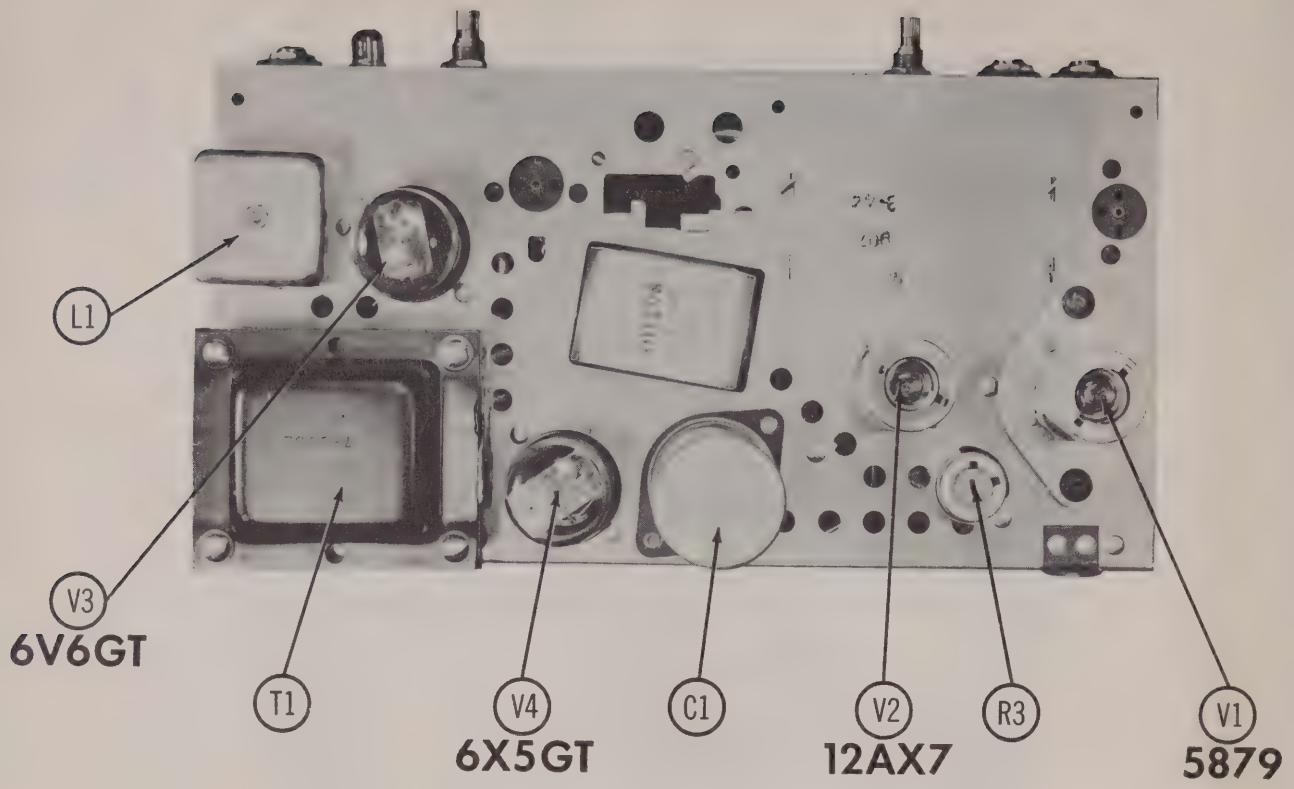


Figure 7

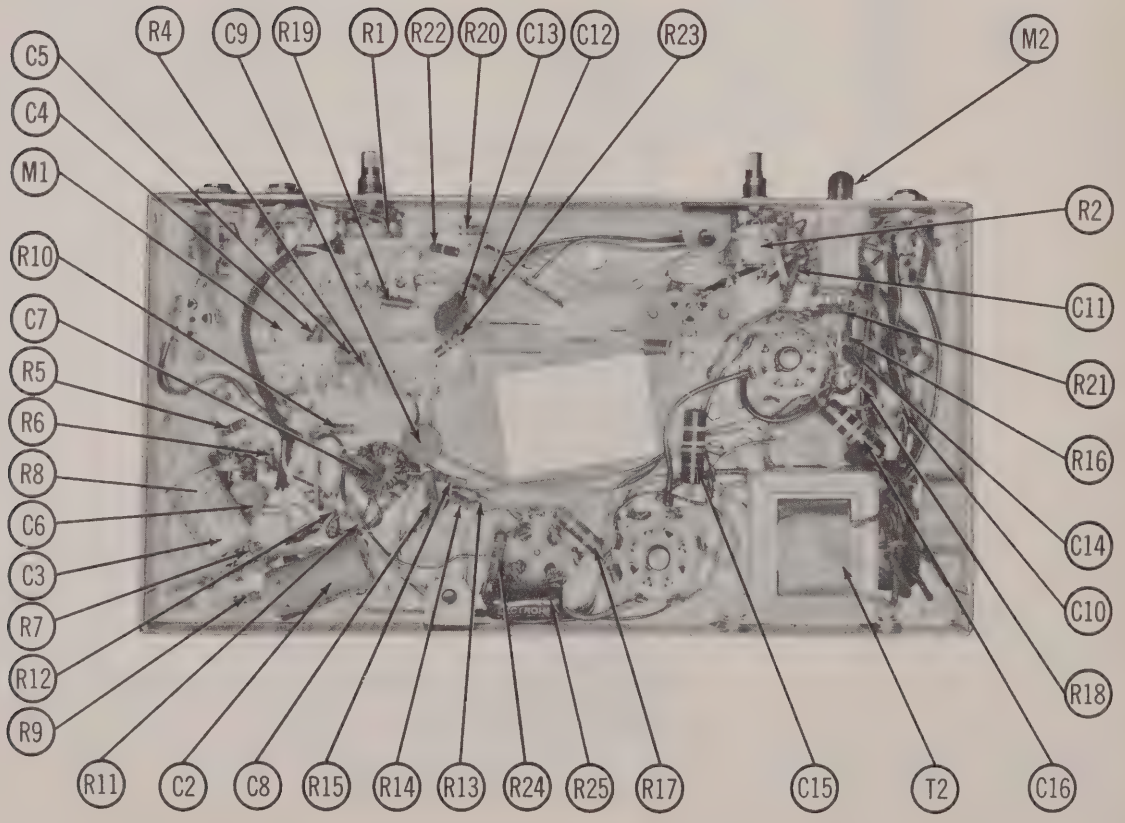
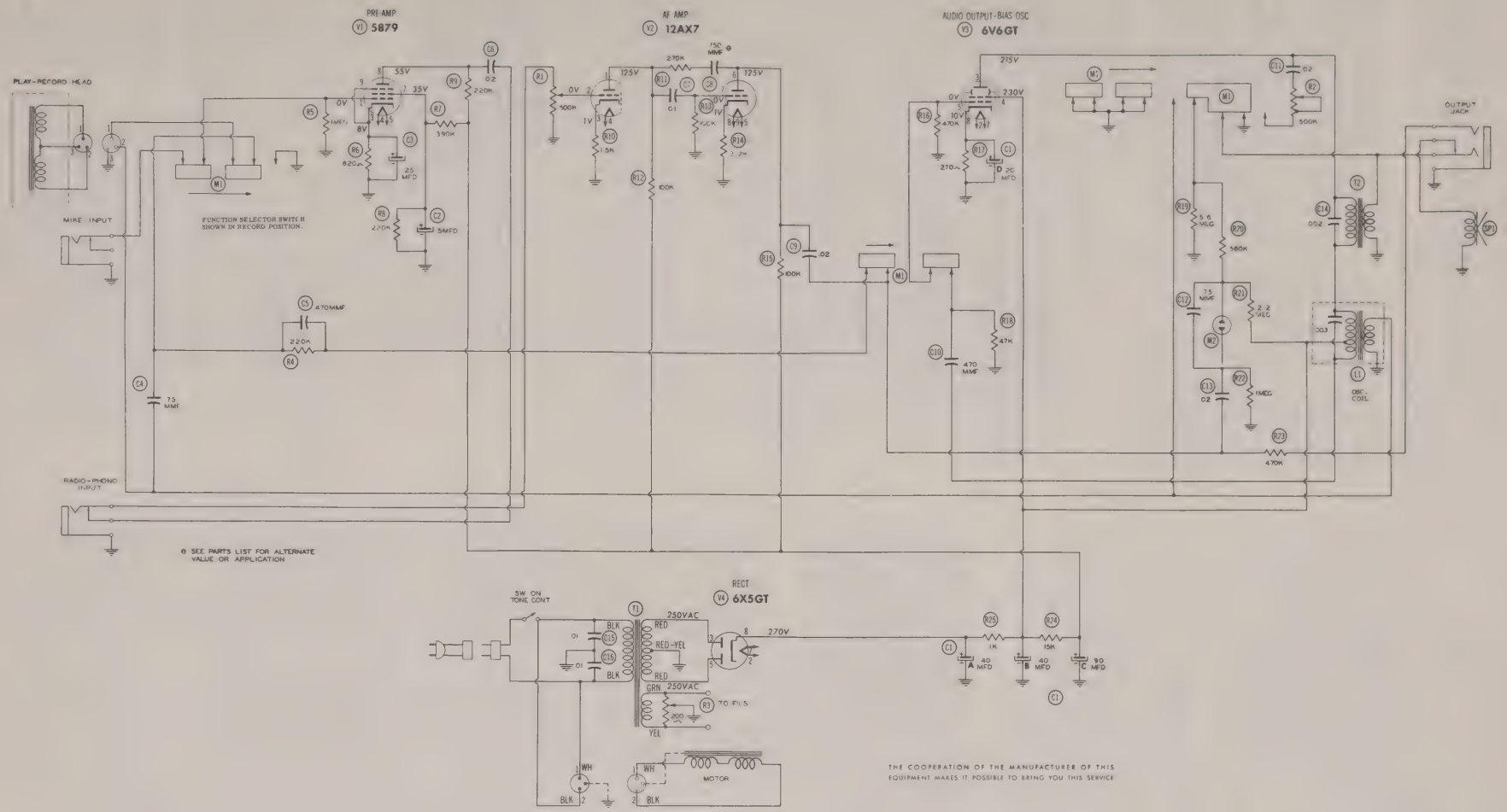


Figure 8



⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	5879	1Meg	0Ω	820Ω	50Ω	50Ω	0Ω	†100KΩ	†235KΩ	820Ω
V 2	12AX7	†115KΩ	500KΩ	1.5KΩ	50Ω	50Ω	†115KΩ	100KΩ	2.2KΩ	50Ω
V 3	6V6GT	0Ω	50Ω	†1.5KΩ	†1KΩ	470KΩ	0Ω	50Ω	270Ω	
V 4	6X5GT	0Ω	50Ω	370Ω	0Ω	380Ω	INF	50Ω	55KΩ	

MEASUREMENTS IN PLAY POSITION
† MEASURED FROM PIN 8 OF V4

A PHOTOFACT STANDARD NOTATION SCHEMATIC
©Howard W. Sams & Co., Inc. 1954

PROPERTY OF
L. F. BLANKENSHIP
3924 MADE ST.
DENVER, COLORADO
239-3

revolve. If one or the other does, force the stop arm (point "B" on exploded view) over until it stops revolving.

Lifter Arm (23) Adjustment-

This adjusts the distance that the contact strip on the play-record switch will move when going into the record position. If an adjustment is necessary, depress and turn the play-record control (4) clockwise. Loosen the set screw in the lifter arm (23) and rotate control knob (4) to the left or right to center the contact strip with the contacts on the left end of the switch. Make sure lifter arm (23) is down as far as it will go and tighten its set screw.

Play-Record-Erase Head Adjustment-

It is very important that the head be lined up perfectly with the tape. If it is not, low output, loss of high frequencies or track overlap may result. If the head is to be replaced, the complete assembly of the head and the bracket (19) that it mounts in should be changed. The bracket is adjusted to the head and sealed in place at the factory. There are two adjustments to be made which are as follows:

1. One is the head height. This is set be placing a .179" gauge (between 11/64" and 3/16") on the motorboard (34) under where the head is mounted. The head is pushed down flush with this gauge and tightened in place and the gauge removed. If a gauge is not obtainable set the head height while the unit is pulling tape. Move the head slowly up until the top edge of the tape is hitting the edge of the tape guides on the motorboard.

2. The second adjustment is for output and frequency response. To set this make a recording of a 3000 cycle signal on a good unit. Place this on the unit that the head is to be aligned on. Connect an output meter or AC voltmeter across the speaker voice coil. Play the 3000 cycle tape, rock the head holder (19) back and forth, screw (26) holding the holder on to the motorboard bracket will allow you to do this, and notice the variation in the output voltage at the voice coil. Tighten the head holder in the position of highest output. Make sure the head was not moved up or down while rocking it. If a 3000 cycle signal tape cannot be made, record a record with some high notes on it on another unit. Play this back on the unit to be adjusted and rock the head to give best high note response.

After setting the height and output check unit for track overlap. To do this take a reel of tape that has no recording on it. Make a recording on the unit that the head has been adjusted on. Do not rewind but take the reels off, reverse them and play the other track. There should be no sound heard. If what was recorded is heard backwards then there is track overlap. If this is the case, the guide on the head holder should be bent up to move the tracks further apart.

Pressure Pad Adjustment-

This applies the correct pressure between the tape and the head. To adjust this, loosen screw (13) that holds pressure pad bracket (15). Turn play-record control (4) clockwise. Move bracket (15) forward until the pressure pad moves back against its spring 1/16". Make sure the front edge of the bracket is parallel with the head and tighten screw (13).

NOTE: When ordering a replacement head, be sure to get the complete assembly of head, plug and bracket. The bracket is adjusted to the individual head and sealed at the factory. Also, when ordering a replacement motor, be sure to get the complete assembly of motor, pulley and plug. The pulley is turned down on the individual motor and is not interchangeable.

Hum Balance Adjustment-

If tube V1 or V2 is replaced or the head changed the setting of the hum balance pot. (R3) should be checked. To do this, connect an external speaker to the unit as described under "To Use An External Speaker". Connect an AC voltmeter with a .1 volt AC scale across the speaker voice coil. Turn the "Volume" and "Tone" controls clockwise. Place the play-record control (4) in "Play" position. Put the AC meter on the .1 volt scale and adjust the hum pot. (R3), which is located between tubes V1 and V2 on top of the chassis, to its minimum reading. It should not exceed .1 volt. This is the only adjustment required in the amplifier.

LUBRICATION

The lubricants applied at time of manufacture should be sufficient for a long period of time. Approximately once a year, or in the event that parts are replaced, lubricate the unit as follows:

With No. 20 Motor Oil-

1. Take up reel arm (43) bushing.
2. Feed reel arm (51) bushing.
3. Spindle (11 and 12) bearings.
4. Flywheel (49) bearings.
5. Idler roller (56) bearing.
6. Pressure roller (18) bearing.

With Staput No. 312 grease or lubriplate-

1. Pressure plate (33) at the slide buttons and the guide on the right side.
2. On the stud of the lifter arm (23).

CAUTION: Do not oil the motor bearings unless absolutely necessary as excess oil will only be thrown off and cause slipping of the pulleys and rollers. Always use as little oil as possible. If oil should get on the pulleys and rollers wipe off with a petroleum solvent, such as alcohol. Do not use carbon tetrachloride.

TROUBLES

Won't Take Up Tape Properly-

1. Spindle (11) binding.
   (a) Lubricate.
2. Improper take up spring (46) adjustment.
   (a) See "Take Up Spring Adjustment".
3. Belt (61) slipping.
   (a) Clean motor pulley and pulley (54).
4. Belt (61) broken.
   (a) Remove bracket (64) and replace belt.
5. Set screw loose in pulley (54).
   (a) Tighten and leave 1/32" to 1/16" end play in spindle.
6. Pulley (54) broken.
   (a) Replace pulley.

Fast Forward Won't Function Properly-

1. See above except for step 2.

Fast Rewind Won't Function Properly-

1. Spindle (11 or 12) binding.
   (a) Lubricate.
2. Belt (62) slipping.
   (a) Clean motor pulley and pulley (55).
3. Belt (62) broken.
   (a) Remove bracket (64) and replace belt.
4. Set screw loose in pulley (55).
   (a) Tighten and leave 1/32" to 1/16" end play in spindle.
5. Pulley (55) broken.
   (a) Replace pulley.

Speed Variation or Wow-

1. Slippage.
   (a) Clean motor pulley, idler roller (56), flywheel and capstan (49) and pressure roller (18) with a petroleum solvent, not carbon tetrachloride. Replace rubber rollers if they appear oil soaked.
2. Too much feed reel drag.
   (a) Check adjustment as described under "Take Up Reel Seat And Feed Reel Seat Drag Adjustment".
3. Flat spot on rubber roller (18) or (23).
   (a) A rapid thumping sound while the unit is running may indicate a flat spot on one of the rubber tires. If this condition does not clear up after several minutes of running time, replace the defective roller.
   (b) If the surface of the rubber tire is not smooth and even, replace the part.
   (c) Should the bearings of the rollers show signs of excessive wear or be extremely wobbly, the rollers should be replaced.
4. Tight feed or take up spindle (11 or 12)
   (a) Check adjustment as described under "Spindle End Play Adjustment".
   (b) Lubricate.
5. Tight pressure roller (18).
   (a) Lubricate.
6. Tight flywheel shaft (49).
   (a) Lubricate.
7. Tight idler roller (56).
   (a) Lubricate.
8. Pressure pad assembly (15) applying too much pressure against tape.
   (a) Check adjustment as described under "Pressure Pad Adjustment".

PROPERTY OF
L. F.
DENVER, COLORADO

CLEANING

The record-playback head (20), capstan shaft and pressure roller (18) are subject to an accumulation of tape coating residue, which is worn off the tape as it passes these parts. This can cause distortion, weak output and poor erasure. Use a soft cloth and alcohol to clean the head surfaces, capstan and pressure roller.

CAUTION: Do not use a brush or any metallic object when cleaning the record-playback head as this could possibly mar the head surface.

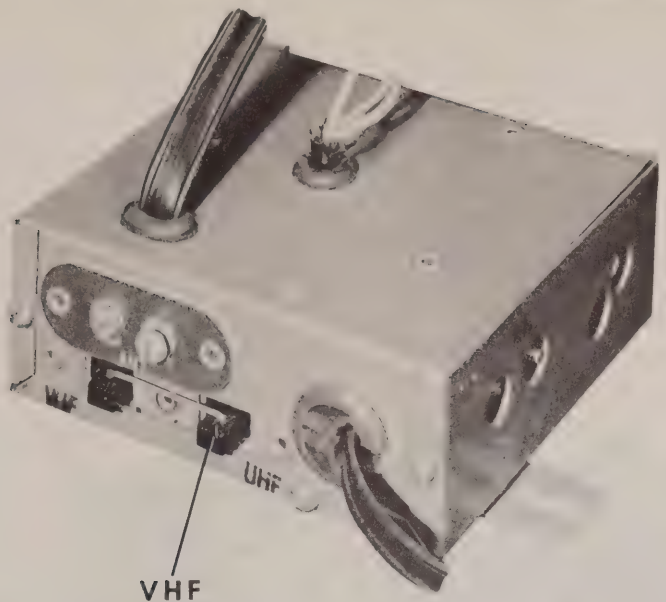
ELECTRICAL PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
V1	730031	5879, Pre-Amp.	R3	740045	Hum Balance Cont., 200Ω W. W.
V2	730022	12AX7, AF Amp.	R4	760015	Resistor, 220KΩ, 1/2 Watt
V3	730004	6V6GT, Audio Output-Bias Osc.	R5	760001	Resistor, 1 Meg., 1/2 Watt
V4	730005	6X5GT, Rectifier	R6	760025	Resistor, 820Ω, 1/2 Watt
C1A	770088	Elect. Cap., 40mfd @ 300V.	R7		Resistor, 390KΩ, 1/2 Watt
C1B		Elect. Cap., 40mfd @ 300V.	R8	760015	Resistor, 220KΩ, 1/2 Watt
C1C		Elect. Cap., 90mfd @ 300V.	R9	760015	Resistor, 220KΩ, 1/2 Watt
C1D		Elect. Cap., 20mfd @ 25V.	R10	760003	Resistor, 1.5Ω, 1/2 Watt
C2	770074	Elect. Cap., 5mfd @ 150V.	R11	760052	Resistor, 270KΩ, 1/2 Watt
C3	770033	Elect. Cap., 25mfd @ 25V.	R12	760010	Resistor, 100KΩ, 1/2 Watt
C4	770097	Cap. Ceramic Tub., 75mmf. ± 10%	R13	760010	Resistor, 100KΩ, 1/2 Watt
C5	770090	Cap. Ceramic Tub., 470mmf. ± 10%	R14	760047	Resistor, 2.2KΩ, 1/2 Watt
C6	770095	Cap. Ceramic, .02mfd @ 500V.	R15	760010	Resistor, 100KΩ, 1/2 Watt
C7	770096	Cap. Ceramic, .01mfd @ 500V.	R16	760037	Resistor, 470KΩ, 1/2 Watt
C8	770094	Cap. Ceramic Tub., 750mmf. ± 10% (Used with Model 907 only)	R17	760115	Resistor, 270Ω, 1 Watt
			R18	760013	Resistor, 47KΩ, 1/2 Watt
	770098	Cap. Ceramic Tub., 1500mmf. ± 10% (Used with Model 903 only)	R19	760054	Resistor, 5.6 Meg., 1/2 Watt
			R20	760039	Resistor, 560KΩ, 1/2 Watt
C9	770095	Cap. Ceramic, .02mfd @ 500V.	R21	760040	Resistor, 2.2 Meg. 1/2 Watt
C10	770090	Cap. Ceramic Tub., 470mmf. ± 10%	R22	760001	Resistor, 1 Meg. 1/2 Watt
C11	770095	Cap. Ceramic, .02mfd @ 500V.	R23	760037	Resistor, 470KΩ, 1/2 Watt
C12	770097	Cap. Ceramic Tub., 75mmf. ± 10%	R24	760027	Resistor, 15KΩ, 1/2 Watt
C13	770095	Cap. Ceramic, .02mfd. @ 500V.	R25	760304	Resistor, 1K, 5 Watt, W. W.
C14	770093	Cap. Ceramic, .002mfd. @ 500V.	T1	700054	Power Transformer
C15	770071	Cap. Molded Paper, .01mfd @ 400V.	T2	700055	Output Transformer
C16	770071	Cap. Molded Paper, .01mfd @ 400V.	L1	700056	Osc. Coil
R1	740051	Volume Cont., 500K	M1	011301	Play-Record Switch
R2	740052	Tone Cont. & Switch, 500K	M2	730006	Record Level Lamp, Neon, Type NE51
			SP1	011298	PM Speaker, 5 1/2"

MECHANICAL PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	460112	Spring Retainer	34	011309	Motorboard Staking Assembly & Riveting
2	310144	Reel Plate			
3	100672	Head Cover	35	600111	Hex. Hd. M.S., 6-32 x 1/4
4	310147	Mechanism Control Knob	36	460117	Control Shaft Retainer
5	100687	Cover	37	420109	Record Release Spring
6	460112	Spring Retainer	38	100660	Position & Shaft Bracket
7	310144	Reel Plate	39	011305	Idler Slide & Stud Assembly
8		Top Panel	40	420106	Anti Rattle Spring
9	310146	Rewind Control Knob	41	420107	Spindle Arm Spring
10	310146	Fast Forward Control Knob	42	420115	Idler Slide Spring
11	011319	Spindle Assembly	43	011329	Take Up Reel Arm Assembly
12	011319	Spindle Assembly	44	580139	Fibre Washer
13	600180	Screw, 6-32 x 5/16 Hex. Hd.	45	460110	Hair Pin Clip
14	580043	Flat Washer, .142 x 5/16 x 1/32	46	011328	Take Up Lever & Spring Assembly
15	011315	Pressure Pad Bracket Assembly	47	200288	Slide Button
	011316	Pressure Pad Assembly	48	600243	Phillips Flat Hd. M.S., 6-32 x 1/4
	420104	Pressure Pad Spring	49	011327	Flywheel & Capstan Shaft Assembly
16	460111	Spring Retainer	50	011308	Control Shaft & Lever Assembly
17	580143	Cloth Washer	51	011330	Feed Reel Arm Assembly
18	011236	Pressure Roller	52	580139	Fibre Washer
19	100556	Head Holder	53	460110	Hair Pin Clip
20	011312	Play-Record-Erase Head and Plug Assembly	54	011317	Pulley & Set Screw Assembly
			55	011317	Pulley & Set Screw Assembly
21	200288	Slide Button	56	011297	Idler Roller Assembly
22	100658	Tension Arm	57	580020	Washer, Cloth Graphite Imp.
23	011307	Lifter Arm & Set Screw Assembly	58	460116	"C" Washer
24	460114	Flywheel Retainer	59	580056	Flat Washer, .188 x 7/16 x .032
25	580141	Flat Washer, .315 x .01	60	600137	Hex. Hd. M.S., 8-32 x 1/4
26	600113	Screw, 8-32 x 5/16 Hex. Hd.	61	490053	Take Up Reel Drive Belt
27	580056	Flat Washer, .188 x 7/16 x .032	62	490053	Feed Reel Drive Belt
28	420105	Pressure Plate Return Spring	63	011399	Motor, Pulley & Plug Assembly (Model 907)
29	580143	Cloth Washer			
30	600243	Phillips Flat Hd. M.S., 6-32 x 1/4		011400	Motor, Pulley & Plug Assembly (Model 903)
31	200288	Slide Button			
32	420110	Tension Arm Spring	64	011325	Shock Mount & Bracket Assembly
33	011314	Pressure Plate & Stud Assembly			

CREST
MODELS 10A, 10B (UHF Conv.)



VHF
UHF
CHANGEOVER
SWITCH

PROPERTY OF
L. F. [illegible]
[illegible]
DENVER, COLORADO

CREST
MODELS 10A, 10B (UHF Conv.)

TRADE NAME	Crest Models UHF 10A, 10B
MANUFACTURER	Crest Laboratories, Inc.
TYPE SET	Single Channel UHF Conv.
TUBES (One)	6T4 or 6AF4 Oscillator
POWER SUPPLY	Obtained from VHF Receiver
TUNING RANGE	Any one UHF Channel

ALIGNMENT INSTRUCTIONS--READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

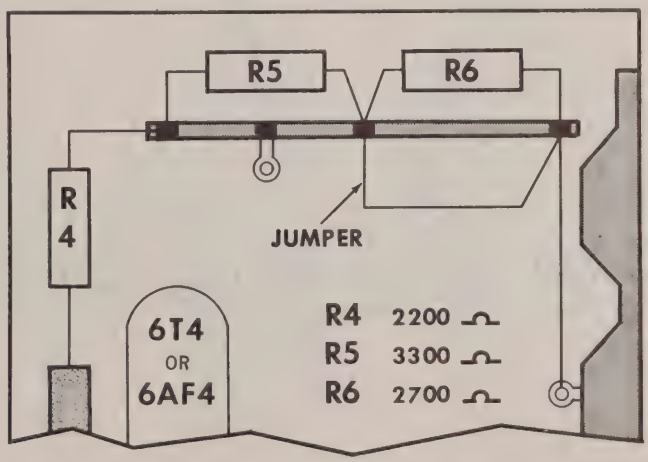
Turn the TV receiver on and switch channel selector to either channel 5 or 6. (Select the channel NOT receiving VHF programs in that area). Since the converter is shipped pre-tuned only minor adjustments of the oscillator and RF circuits will be necessary.

(A) Adjust A1 not more than one turn in either direction until sound or picture is received.
(B) Adjust A2 and A3 for strongest picture.
(C) A4 is a fine tuning adjustment. Adjust for clearest picture with best sound.

The UHF 10A and 10B converters are shipped from the factory, pre-tuned for the UHF channel indicated on the unit. However, it is designed to permit repeaking in the field over a 15 channel range as follows: Adjustment of A1, A2 and A3 in a counter clockwise direction tunes the converter to a higher channel while clockwise adjustment of A1, A2 and A3 tunes converter to a lower channel.

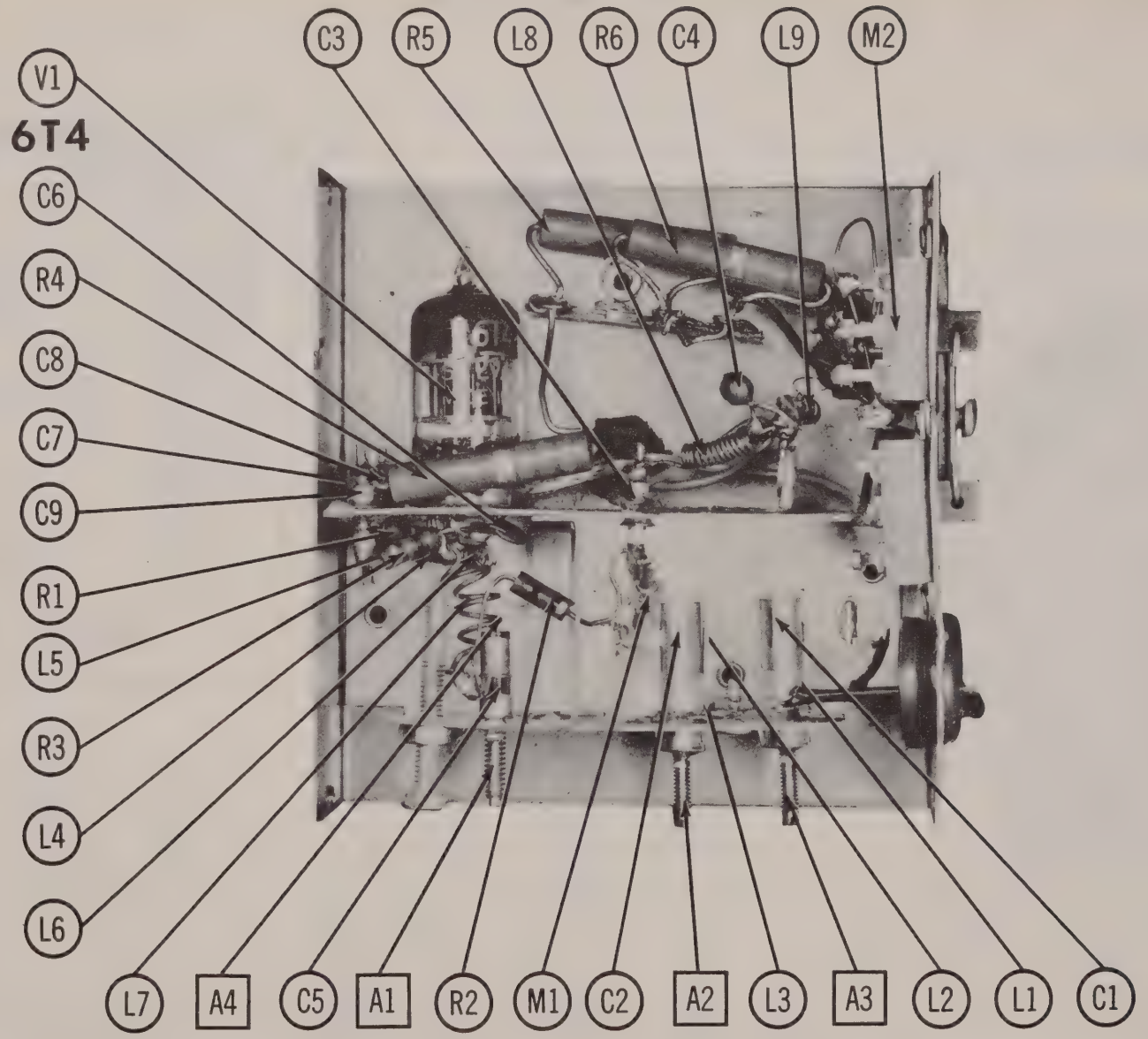
Power is obtained from the VHF TV receiver audio output tube socket, thru the use of adaptor plugs. These units are shipped from the factory with the B+ dropping circuits connected to operated on B+ voltage between 190 and 230 volts. The dropping circuit resistors and jumpers shown in the sketch below should be connected as shown in the table for voltage other than 190 to 230 volts.

B PLUS SUPPLY VOLTAGE	DROPPING CIRCUIT RESISTANCE
80 to 120V	0Ω
120 to 160V	2.2KΩ
140 to 180V	3.3KΩ
180 to 220V	2.2KΩ & 2.7KΩ
190 to 230V	2.2KΩ & 3.3KΩ
200 to 240V	2.7KΩ, 2.2KΩ & 3.3KΩ



HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1954 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America



CHASSIS BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		CREST PART No.	STANDARD REPLACEMENT		
V1A	UHF Oscillator	6T4	6T4	7DK	
B	UHF Oscillator	6AF4	6AF4	7DK	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	CREST PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1	1-8						532-10			
C2	1-8						532-10			
C3	5									
C4	10			SI10	D6-100	TP09	GP1K-100	UC-541	5GA-Q1	Note 1
C5	.5-3				829-3			CT565		
C6	56			SI56	D6-560	G036	GP1K-560	UC-5446	5GA-Q56	
C7	1000			EF-001	MFT-1000					
C8	1000			EF-001	MFT-1000					
C9	1000			EF-001	MFT-1000					

Note 1. Some models use 22MMF in this application.

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	CREST PART No.	IRC PART No.	
R1	10KΩ			BTS-10K	
R2	1 Meg			BTS-1 Meg	
R3	1000Ω			BTS-1000	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	CREST PART No.	IRC PART No.	
R4	2200Ω	2		BTB-2200	Note 1
R5	3300Ω	2		BTB-3300	Note 1
R6	2700Ω	2		BTB-2700	

Note 1. In some models, resistors R4 and R5 are interchanged.

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	CREST PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	UHF Ant. Coil	0Ω (tapped)						
L2	UHF RF Coupling	0Ω						
L3	UHF RF Coil	0Ω(tapped)						
L4	Fil. Choke	0Ω						
L5	Fil. Choke	0Ω						
L6	Cathode Choke	0Ω						
L7	UHF Osc. Coil	0Ω						
L8	UHF IF Coupling	0Ω						
L9	UHF IF Output trans.	0Ω	0Ω					

PARTS LIST AND DESCRIPTIONS (Continued)

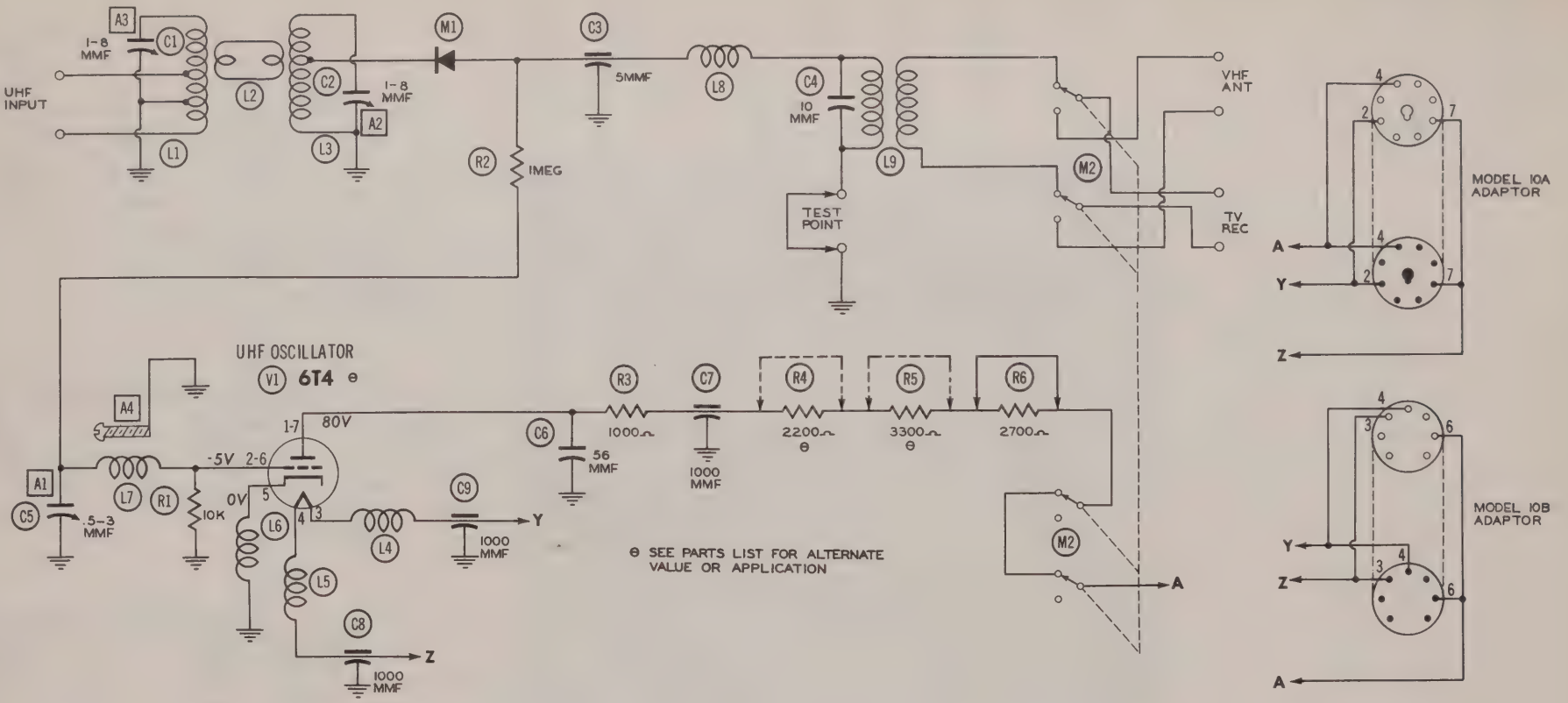
CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		CREST PART No.	SYLVANIA PART No.		
M1	1N82		1N82 or A		UHF mixer- (pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	CREST PART No.	NOTES
M2	Switch		(2) D. P. D. T. (VHF-UHF changeover)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO



THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

©Howard W. Sams & Co., Inc. 1954

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST
DENVER, COLORADO

DEWALD
MODEL H-527

TRADE NAME	Dewald H-Model H-527
MANUFACTURER	Dewald Radio Mfg. Co., 35-15 37th. Ave., Long Island City, N.Y.
TYPE SET	Three Power Portable Superheterodyne Receiver
TUBES (Four)	Types 1R5 Converter, 1U4 IF Amp., 1U5 Det.-AVC-AF Amp., 3V4 Audio Output
POWER SUPPLY	110-120 Volts AC-DC (or) 7½ Volts "A" Supply & 67½ Volts "B" Supply
RATING	.14 Amp. @ 117 Volts AC (or) 50MA @ 7½ Volts DC & 6MA @ 67½ Volts DC
TUNING RANGE—BROADCAST	535-1700KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Use battery power, if possible. If AC power is used, use an isolation transformer when available. If not, connect a .1MFD capacitor in series with low side of the signal generator and B-.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05MFD	High side to antenna stator lug on tuning gang. Low side to B-.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy antenna to 200MMF to reduce hum modulation.
2.		Loop	1700KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal	"	A6	"

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1954 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

DEWALD MODEL H-527

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: DEWALD PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	Converter	1R5	1R5	7AT	
V2	IF Amplifier	1U4	1U4	6AR	
V3	Det-AVC-AF Amp.	1U5	1U5	6BW	
V4	Audio Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: DEWALD PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	50	150	202E-3	PRS106D50A		BBR T5315-X20		3N529	TVA-3433	Yellow
B	30	150								Red
C	200	15								Blue
C2	.05	200		P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C3	100			SI100N750	TCN-101	N042	N750M-101	NT-531	5TCU-T1	
C4	5000			BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C5	.25	200		P288-25		PJ2P25		PT4025	2TM-P25	
C6	5000			BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C7	220			BPD-00022	D6-221	G051	GP1K-221	HC-5322	5GA-T22	
C8	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C9A	5000		♦2067-1	♦PA-117	♦PC-91	♦114TM2	♦1407-03	DC-525	♦103C3	
B	100							UC-531		
C	5000							DC-525		
C10	1000			BPD-001	DD-102	K069	801-001	DC -521	5HK-D1	
C11	.05	400		489ZX-05	DF-503	PJ4S5		PT415	4TM-S5	
C12	20000			BPD-02	DF-203	K085			5HK-D2	

♦ Items C9A, C9B, C9C, R7A, R7B and R7C are combined in one unit.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: DEWALD PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1 Meg	½	3012-2	Q13-137	AG-63-Z	BSK-70-S	U-53	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req	Attach to R1A
C	Switch		Not Req.	76-2	SWB-2	Not Req.	US-27	Attach to R1A

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: DEWALD PART No.	IRC PART No.	NOTES
R2	3.3Meg	½		BTS-3.3Meg	
R3	100KΩ	½		BTS-100K	
R4	10KΩ	½		BTS-10K	
R5	3.3Meg	½		BTS-3.3Meg	
R6	10 Meg	½		BTS-10 Meg	
R7A	4.7Meg	½	♦2067-1	BTS-4.7Meg	
B	1 Meg	½		BTS-1 Meg	
C	2.2Meg	½		BTS-2.2Meg	

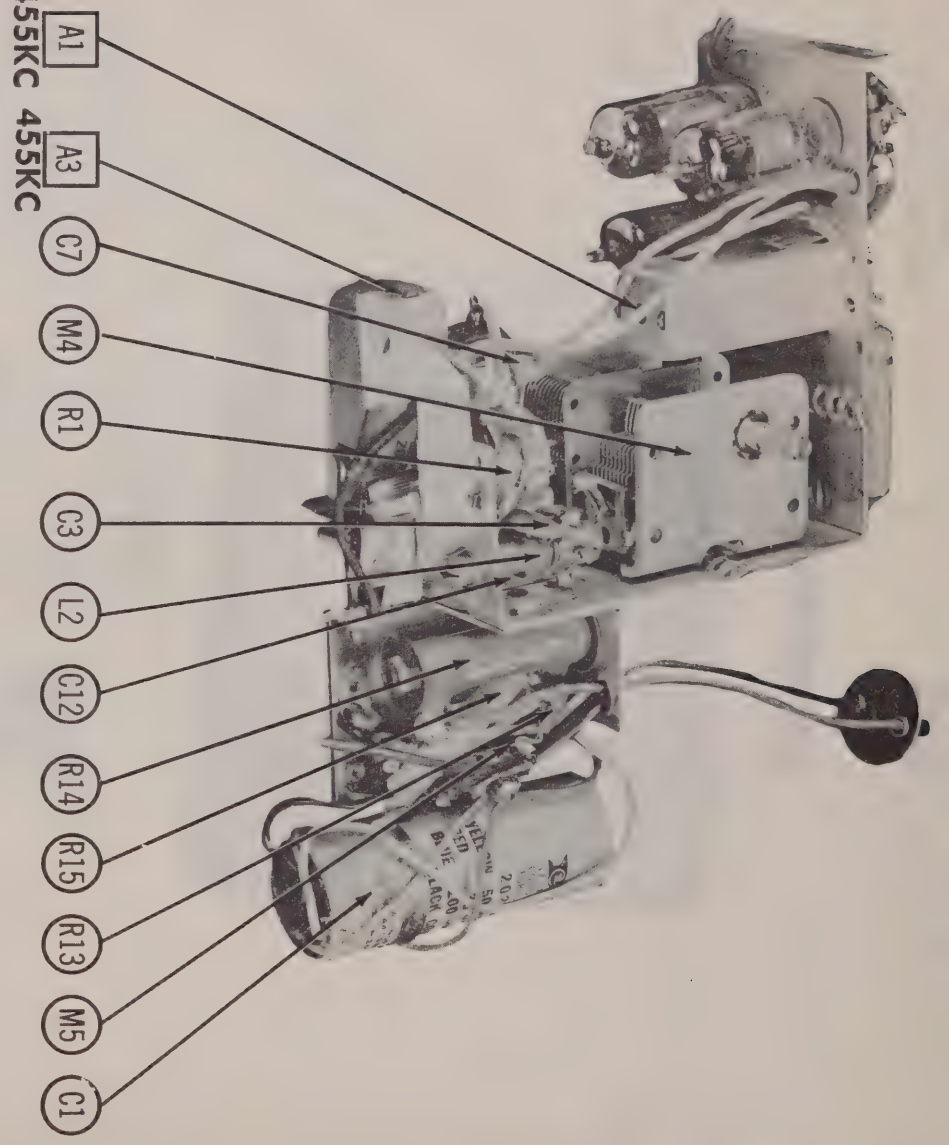
ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: DEWALD PART No.	IRC PART No.	NOTES
R8	120Ω	½		BTS-120	
R9	150Ω	½		BTS-150	
R10	150Ω	½		BTS-150	
R11	330Ω	½		BTS-330	
R12	680Ω	½		BTS-680	
R13	2700Ω	½		BTS-2700	
R14	2500Ω	10		1 3/4A-2500	
R15	56Ω	1			

♦ Items R7A, R7B, R7C, C9A, C9B, C9C are combined in one unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: DEWALD PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	NOTES
T1	9.6KΩ	3.3Ω	Part of Spkr.	A-3329①	A-2998 ①	S-11X ①	Z1117 ①	TS-24S60①	① Bend mounting tabs down, file out slots, mount on original bracket.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	DEWALD PART No.	VIKING PART No.	QUAM PART No.	
SP1	3½"	PM	3.3Ω	7032	35J4	3A07	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	DEWALD PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	.8Ω		1144A-2				
L2	Osc. Coil	.8Ω	5.5Ω	1145A	14-1074		71-Osc.	
L3	Input IF	25Ω	25Ω	1091C-5	16-6758	BC-352	12-C1	
L4	Output IF	25Ω	25Ω	1091C-5	16-6758	BC-353	12-C2	

SELENIUM RECTIFIER

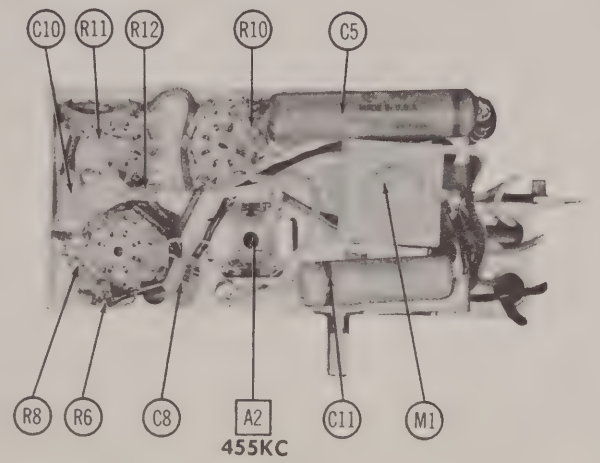
ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT	DEWALD PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	
M1	.065ADC	8018B	5M4	1003	6S75	75	

BATTERIES

ITEM No.	VOLTAGE	DEWALD PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M2	7½ "A"		717			C5			
M3	67½ "B"			477			P45		

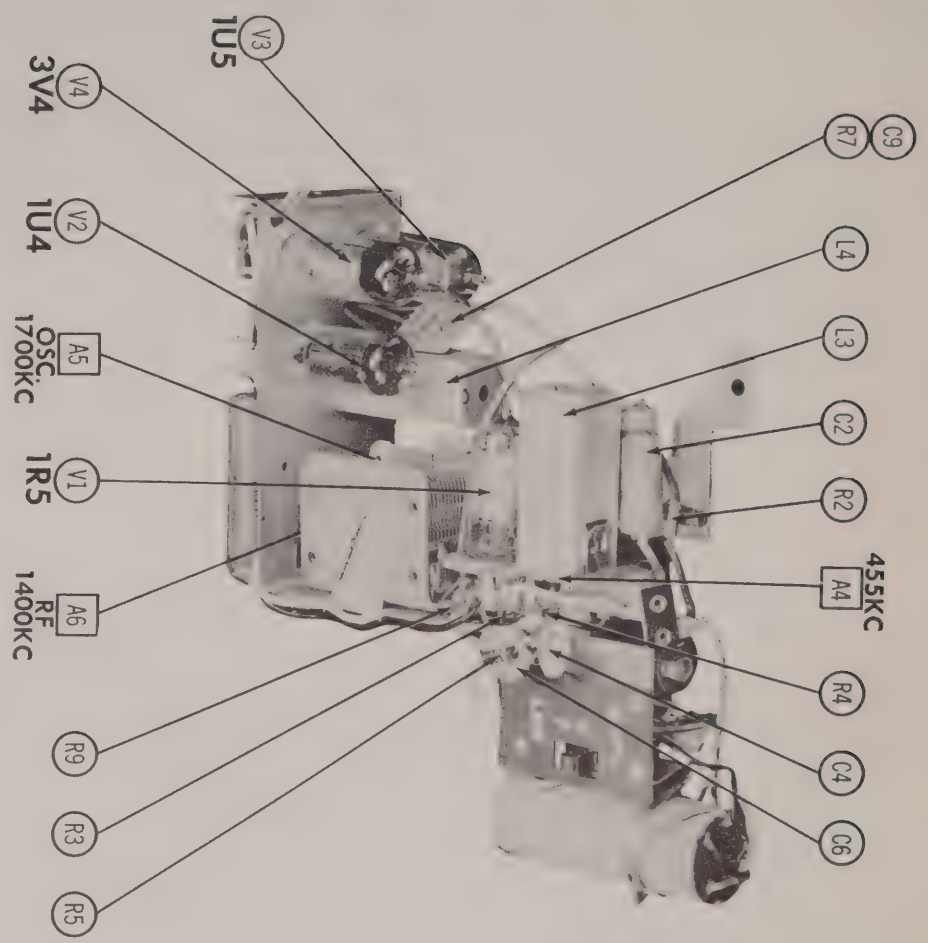
MISCELLANEOUS

ITEM No.	PART NAME	DEWALD PART No.	NOTES
M4	Tuning Cap.	2065-5	2 Section (34-467MMF, 30-200MMF)
M5	Switch	8086-2	Power changeover
	Cabinet	4196C	
	Knob	4197A	Volume
	Knob	4195B-1	Tuning



CHASSIS BOTTOM VIEW

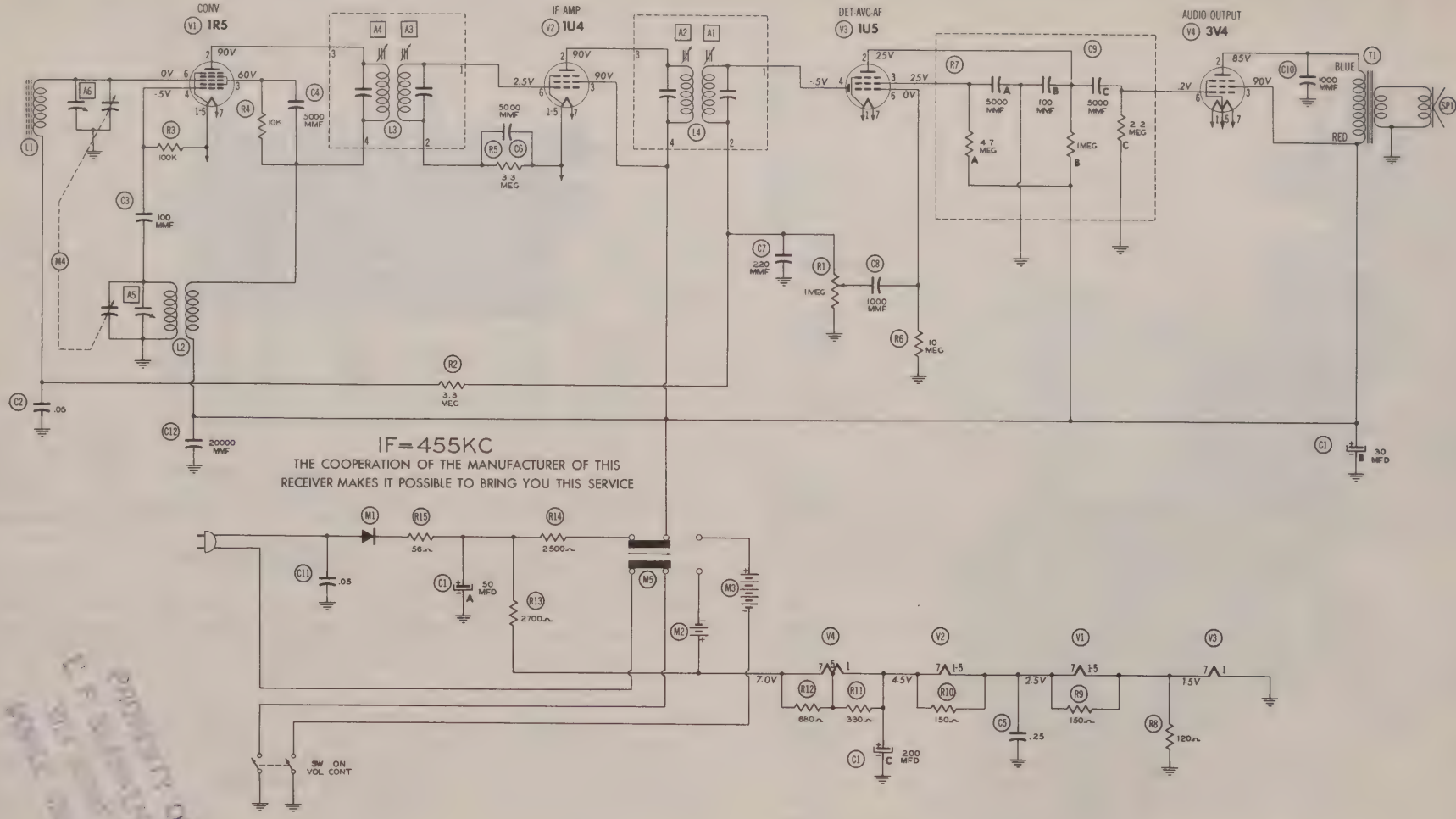
CHASSIS—BOTTOM VIEW



PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

DEWALD
MODEL H-527

DEWALD
MODEL H-527



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	*	†2.8KΩ	†12.7KΩ	100KΩ	*	4.3Meg	*
V 2	1U4	*	†2.8KΩ	†2.8KΩ	INF	*	3.3Meg	*
V 3	1U5	*	†1Meg	†4.7Meg	1Meg	1Meg	10Meg	*
V 4	3V4	*	†3.1KΩ	†2.7KΩ	INF	*	2.2Meg	*

*** DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE**
† MEASURED FROM OUTPUT OF M1

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1954

PHOTOFACT* Folder

RAYTHEON MODELS UC-2139A, UC-2141A, UC-2142A, UC-2144A, UC-2145A, UM-2133A, UM-2134A, UM-2135A, UM-2136A

IMPORTANT FILING NOTICE

The contents for this envelope will be found among the last folders in this complete set of folders . . . *unless* it has been purchased as part of a *complete* volume of PHOTOFACTS assembled in a DeLuxe Binder.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

RAYTHEON MODELS UC-2139A, UC-2141A, UC-2142A, UC-2144A, UC-2145A, UM-2133A, UM-2134A, UM-2135A, UM-2136A

MODEL UM-2133A

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

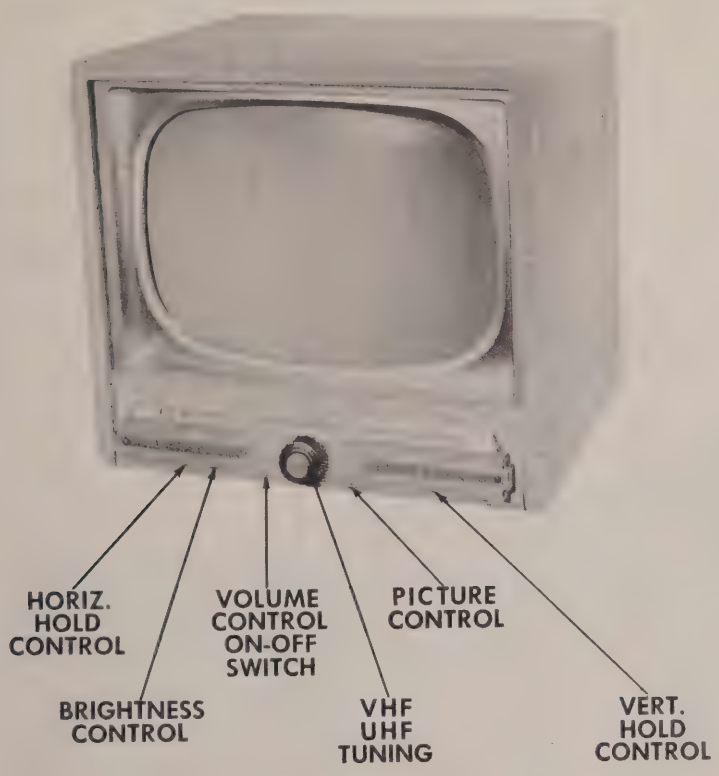
"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1954 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

DATE 5-54 SET 239 FOLDER 7

PHOTOFACT* Folder

RAYTHEON MODELS UC-2139A, UC-2141A, UC-2142A, UC-2144A, UC-2145A, UM-2133A, UM-2134A, UM-2135A, UM-2136A

PROPERTY OF
L. F. ROWENSHIP
1024 MAIN ST.
DENVER, COLORADO



RAYTHEON MODEL UM-2133A

TRADE NAME	Raytheon Models UC-2139A, UC-2141A, UC-2142A, UC-2144, UC-2145A, UM-2133A, UM-2134A, UM-2135A, UM-2136A, (Ch. 21T8)
MANUFACTURER	Raytheon Manufacturing Co., Television & Radio Div., 5921 W. Dickens Ave., Chicago, Ill.
TYPE SET	Television Receiver
TUBES	Twenty-one
POWER SUPPLY	105-115 volts AC-60 cycle RATING 1.6 amp. @ 115 volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

INDEX

Alignment Instructions 5, 6, 7
Drive Cord Stringing 23
Disassembly Instructions 22
Horizontal Sweep Circuit Adjustments 13
Parts List and Descriptions ..... 15 thru 18
Photographs
Antenna Sub-Assembly 20
Cabinet-Rear View 13
Capacitor & Alignment Identification (RF-IF Chassis) 8
Capacitor & Alignment Identification (Sweep Chassis) 4
Chassis-Top View 3
Power Supply Chassis 21
Photographs (Cont)
RF Tuner 14, 20
Resistor & Inductor Identification (RF-IF Chassis) 9
Resistor & Inductor Identification (Sweep Chassis) 19
Resistance Measurements 11
Servicing in the Field 22
Schematic 2
Trouble Shooting Aids 12, 21
Tube Failure Check Chart 10
Tube Placement Chart (Bottom View) 11
Tube Placement Chart (Top View) 10

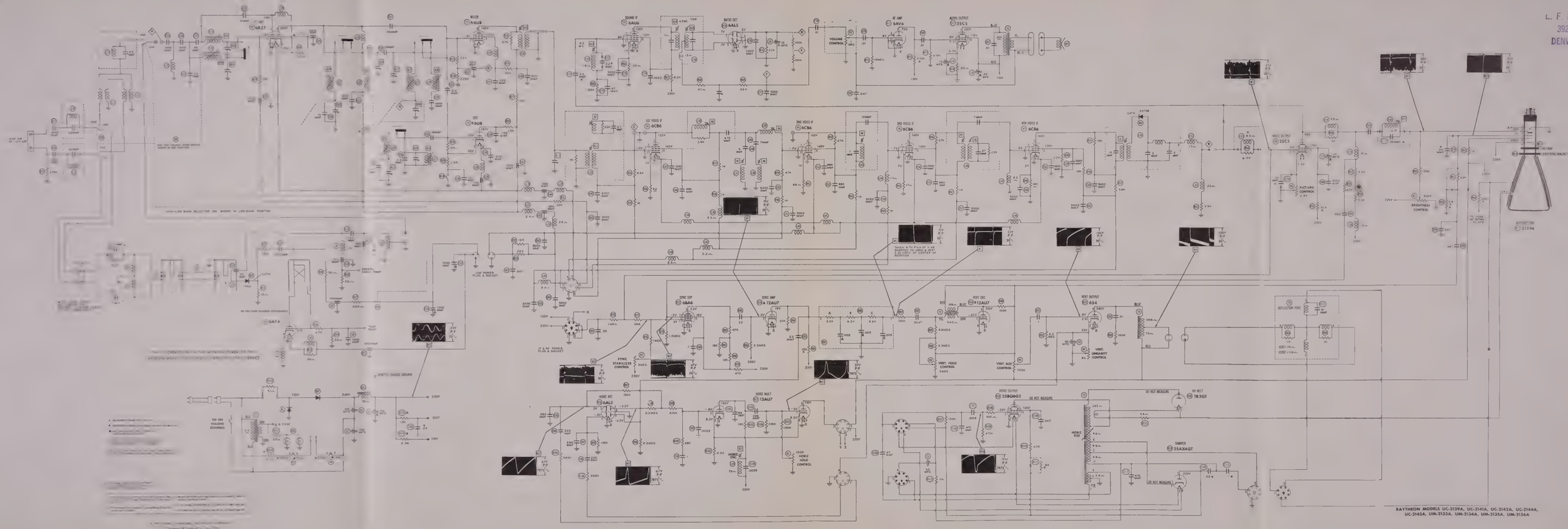
RAYTHEON MODELS UC-2139A, UC-2141A, UC-2142A, UC-2144A, UC-2145A, UM-2133A, UM-2134A, UM-2135A, UM-2136A

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1954 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

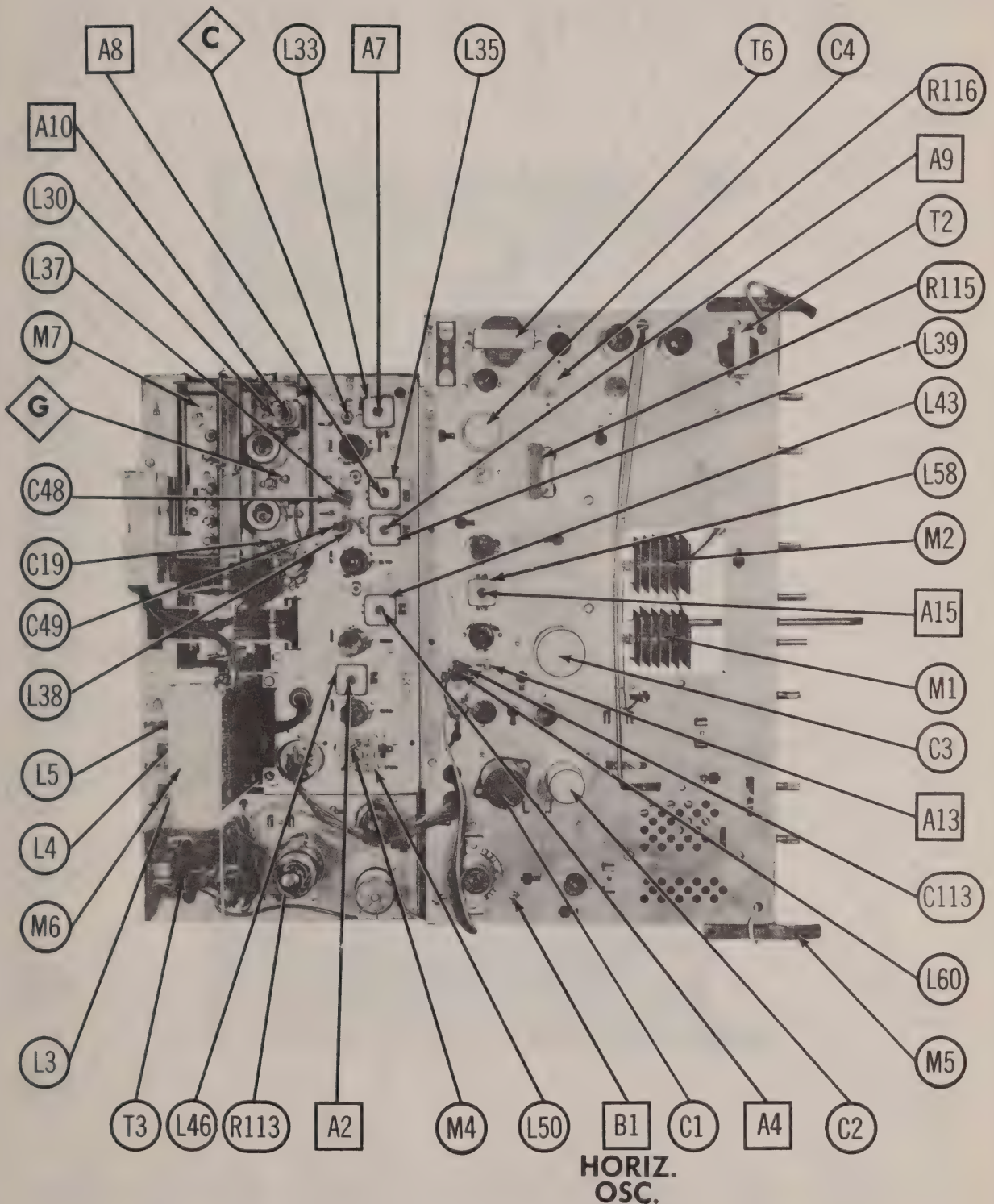
DATE 5-54 SET 239 FOLDER 7

... OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

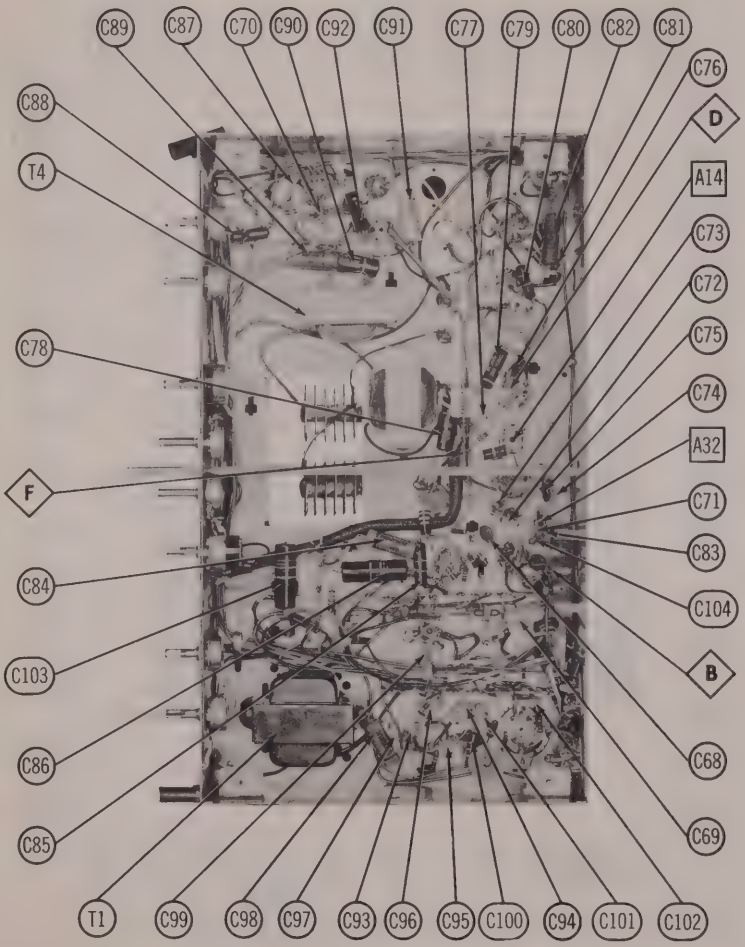


RAYTHEON MODELS UC-2139A, UC-2141A, UC-2142A, UC-2144A,
UC-2145A, UM-2133A, UM-2134A, UM-2135A, UM-2136A

PROPERTY OF
L. L. BLANKENSHIP
[illegible] MEADE ST.
DENVER, COLORADO



CHASSIS TOP VIEW



SWEEP CHASSIS-BOTTOM VIEW CAPACITOR AND ALIGNMENT IDENTIFICATION

ALIGNMENT INSTRUCTIONS

PROPERTY OF L. F. BLANKENSHIP DENVER, COLORADO

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal multivibrator tube (V17) to disable the high voltage.
Allow at least a 5 minute warm-up period for receiver and test equipment.
Use an isolation transformer to protect the test equipment.

VIDEO IF ALIGNMENT

Couple generator to alignment points (A) and (C) thru alignment plug (Fig. 1).
In adjusting A2, A3, A7 and A11, two peaks may be obtained. The correct peak occurs with the corefurtherest out of coil form.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001MFD	High side to point (A). Low side to chassis.	Not used	43.7MC (Unmod)	7 (Approx.)	Use VTVM. DC probe thru 10KΩ to point (B). Common to chassis.	A1	Adjust for maximum deflection. Attenuate generator to maintain approximately 2 volts at VTVM.
2.	"	"	"	41.4MC	"	"	A2	Adjust for MINIMUM deflection.
3.	"	"	"	45.15MC	"	"	A3	Adjust for maximum deflection. Attenuate generator to maintain approximately 2 volts at VTVM.
4.	"	"	"	42.1MC	"	"	A4	"
5.	"	"	"	41.25MC	"	"	A5	Adjust for MINIMUM deflection.
6.	"	"	"	47.25MC	"	"	A6	"
7.	"	"	"	41.4MC	"	"	A7	"
8.	"	High side to point (C). Low side to chassis.	44MC (10MC Swp)	42.0MC 46.0MC	"	Vert. Amp. thru 10KΩ to point (B). Low side to chassis.	A8, A9	Adjust for maximum amplitude and proper bandwidth similar to Fig. 2. Attenuate generator to maintain 2 volts peak to peak on scope.
9.	"	High side to point (A). Low side to chassis.	"	42.0MC 45.6MC	"	"	A10, A11, A12	Adjust for maximum amplitude and proper bandwidth similar to Fig. 3. Attenuate generator to maintain 2 volts peak to peak.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors in series from point (D) to chassis. The junction of these two resistors is alignment point (E) as shown on the schematic.
Short antenna terminals to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	.001MFD	High side to point (B). Low side to chassis.	4.5MC Unmod	Any non-interfering channel	DC probe to point (D). Common to chassis.	A13, A14	Adjust for maximum deflection.
11.	"	"	"	"	DC probe to point (F). Common to point (E).	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Short antenna terminals to chassis.
Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	.001MFD	High side to point (B). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any non-interfering channel	Vert. Amp. to point (D). Low side to chassis.	A13, A14	Disconnect stabilizing capacitor C4C. Adjust for curve of maximum amplitude and symmetry similar to Fig. 4.
11.	"	"	"	"	"	Vert. Amp. to point (F). Low side to chassis.	A15	Reconnect stabilizing capacitor C4C. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 5. SLIGHTLY retouch A14 for maximum amplitude and straightness of crossover lines.

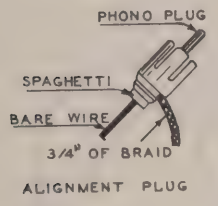


FIG. 1

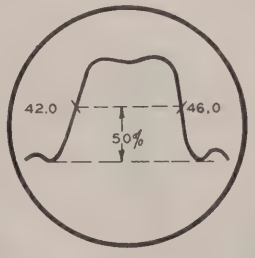


FIG. 2

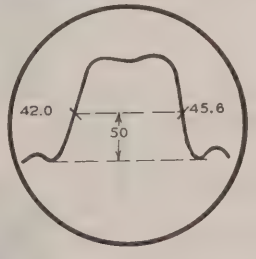


FIG. 3

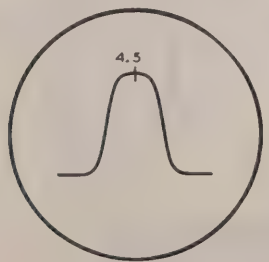


FIG. 4

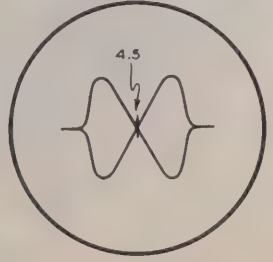


FIG. 5

SET 239 FOLDER 7

RAYTHEON MODELS UC-2139A, UC-2141A, UC-2142A, UC-2144A, UC-2145A, UM-2133A, UM-2134A, UM-2135A, UM-2136A

ALIGNMENT INSTRUCTIONS (cont)

TUNER ALIGNMENT

Preset the trimmer screws (A16 thru A23 as in Fig. 5. Set the tuner treadle bar to the top of its stroke in low band position (cores furtherest out of coil form . Adjust A26 thru A31 so that cores are 1½" from end of coil form.
Adjust A24 and A25 so that the cores are 1 5/8" from end of coil form.

LOW BAND RF ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	85MC (15MC Swp)	83.25MC 87.75MC	6	Vert. Amp. to point (G). Low side to chassis.	A16, A17, A18	Adjust for maximum gain and response similar to Fig. 7. Adjust A18 for maximum gain between markers.
13.	"	"	85MC (10MC Swp)	83.25MC	6 (See Remarks)	Vert. Amp. to point (B). Low side to chassis.	A19	Rotate tuning control until bottom of treadle bar is 1 3/4" from top of tuner chassis. Adjust to place video marker at 50% on response curve as in Fig. 8.
14.	"	"	85MC (15MC Swp)	83.25MC 87.75MC	"	Vert. Amp. to point (G). Low side to chassis.	A16, A17	Readjust for maximum gain and flat topped response similar to Fig. 7.
15.	"	"	57MC (10MC Swp)	55.25MC	2 (See Remarks)	Vert. Amp. to point (B). Low side to chassis.	A24	Rotate tuning control until bottom of treadle bar is 1 1/8" from top of tuner chassis. Adjust to place video marker at 50% on response curve as in Fig. 8. Repeat step 13.
16.	Direct	High side to point (H). Low side to tuner chassis.	43MC (10MC Swp)	42.0MC 45.5MC	(See Remarks)	"	A18	Rotate tuning control until bottom of treadle bar is 5/8" from top of tuner chassis. Check overall IF response curve similar to Fig. 9. If necessary, retouch A18 to obtain desired response.
17.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	79MC (10MC Swp)	77.25MC 81.75MC	5	"		Check each low band channel for response similar to Fig. 10.
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

HIGH BAND RF ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
18.	Two 120Ω carbon resistors	Across VHF antenna terminals with 120Ω in each lead.	213MC (15MC Swp)	211. 25MC 215. 75MC	13	Vert. amp. to point (G). Low side to chassis.	A20, A22, A23	Adjust for maximum gain and flat topped response curve similar to Fig. 7. Adjust A23 for maximum gain between markers.
19.	"	"	213MC (10MC Swp)	211. 25MC	" (See remarks)	Vert. amp. to point (B). Low side to chassis.	A21	Rotate tuning control until bottom of treadle bar is 1 3/4" from top of tuner chassis. Adjust to place video marker at 50% on response curve as in Fig. 8.
20.	"	"	213MC (15MC Swp)	211. 25MC 215. 75MC	13	Vert. amp. to point (G). Low side to chassis.	A20, A22	Readjust for maximum gain and flat topped response similar to Fig. 7.
21.	"	"	177MC (10MC Swp)	175. 25MC 179. 75MC	7 (See remarks)	Vert. amp. to point (B). Low side to chassis.	A25	Rotate tuning control until bottom of treadle bar is 7/8" from top of tuner chassis. Adjust to place video marker at 50% on response curve as in Fig. 8. Repeat step 19. Check each high band channel for response similar to Fig. 10.
22.	"	"	207MC (10MC Swp)	205. 25MC 209. 75MC	12	"		Check each high band channel for response similar to Fig. 10.
			201MC (10MC Swp)	199. 25MC 203. 75MC	11			
			195MC (10MC Swp)	193. 25MC 197. 75MC	10			
			189MC (10MC Swp)	187. 25MC 191. 75MC	9			
			183MC (10MC Swp)	181. 25MC 185. 75MC	8			
			177MC (10MC Swp)	175. 25MC 179. 75MC	7			

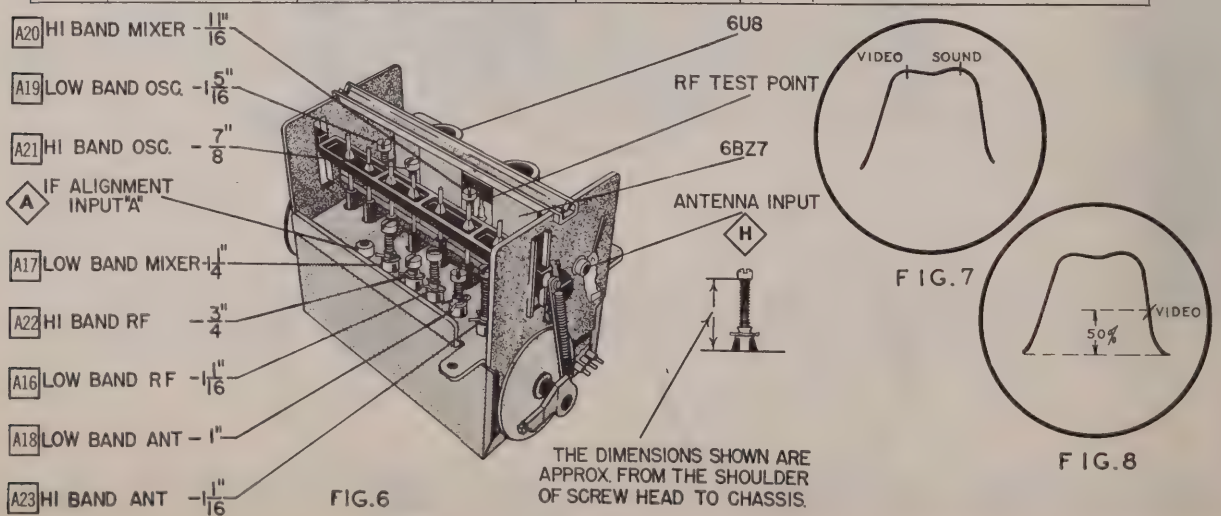

A20 HI BAND MIXER - 1 1/16"
A19 LOW BAND OSC. - 1 5/16"
A21 HI BAND OSC. - 7/8"
(A) IF ALIGNMENT INPUT "A"
A17 LOW BAND MIXER - 1/4"
A22 HI BAND RF - 3/4"
A16 LOW BAND RF - 1 1/16"
A18 LOW BAND ANT - 1"
A23 HI BAND ANT - 1 1/16"
6U8
RF TEST POINT
6BZ7
ANTENNA INPUT
(H)
THE DIMENSIONS SHOWN ARE APPROX. FROM THE SHOULDER OF SCREW HEAD TO CHASSIS.

FIG.6

FIG.7

FIG.8

PROPERTY OF
L. F. BLANKENSHIP
DENVER, COLORADO

ALIGNMENT INSTRUCTIONS (cont)

4.5 MC TRAP ALIGNMENT

Tune in a TV station and adjust the tuning control until sound bars just appear in the picture.
Starting with A32 all the way out adjust clockwise for minimum sound bars in picture.

UHF TUNER ALIGNMENT

Do not remove UHF tuner from chassis. Check to see that 6AF4 (V1) is firmly seated in its socket and shield clip is seated in the tube shield notch.
Check oscillator grid current by connecting a multimeter across R14 (22Ω). A reading of 10 to 30 microamperes should be obtained if oscillator is functioning normally.
Both the oscillator and crystal detector may be checked by placing the multimeter across R10 (22Ω). A reading of 5 to 40 microamperes indicated oscillator and crystal are functioning normally.

MECHANICAL ALIGNMENT OF RF AND MIXER RIBBONS

1. Remove spring and connecting bar on UHF tuner coupling arm.
2. Rotate UHF tuner coupling arm to its counter clockwise stop.
3. The RF and mixer ribbons should be 4 7/8 " as indicated in Fig. 11.
4. If the ribbons are not 4 7/8" as indicated, loosen pulley positioning screw slightly and reposition by turning drive pulleys.
5. Replace spring and connecting bar on UHF tuner coupling arm.

UHF ALIGNMENT

Connect the negative lead of a 6 volt battery to Pin 8 of the RF power socket. Connect positive lead to chassis.
Adjustment of tracking screws must be made from crystal side of tuner and in sequence from 1 through 10.
To perform step 33 it may be necessary to remove the spring and connecting bar on the UHF tuner coupling arm and turn the UHF tuner coupling arm clockwise.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
23.	Two 120Ω Carbon Resistors	Across UHF antenna terminals with 120Ω in each lead.	890MC (10MC Swp)	895MC	(See Remarks)	Vert. Amp. thru 10KΩ to point (B). Low side to chassis.		Loosely couple marker generator to sweep generator leads. Loosen the two oscillator cavity screws and rotate oscillator adjustment (See Fig.11) to obtain response curve similar to Fig. 12 with 895MC marker falling at 50%. Set RF and mixer ribbons to 4 3/4" as indicated in Fig. 11.
24.	"	"	865MC (10MC Swp)	870.5MC	"	"	Tracking screws (Pair #1)	Set ribbons to 4 5/8" as indicated in Fig. 11. Adjust for response similar to Fig. 12.
25.	"	"	775MC (10MC Swp)	780.5MC	"	"	Tracking screws (Pair #2)	Set ribbons to 4 3/16". Adjust for response similar to Fig. 12.
26.	"	"	726MC (10MC Swp)	731MC	"	"	Tracking screws (Pair#3)	Set ribbons to 3 7/8". Adjust for response similar to Fig. 12.
27.	"	"	671MC (10MC Swp)	676MC	"	"	Tracking screws (Pair #4)	Set ribbons to 3 7/16". Adjust for response similar to Fig. 12.
28.	"	"	624MC (10MC Swp)	629.5MC	"	"	Tracking screws (Pair #5)	Set ribbons to 3 1/8". Adjust for response similar to Fig. 12.
29.	"	"	585MC (10MC Swp)	590MC	"	"	Tracking screws (Pair #6)	Set ribbons to 2 3/4". Adjust for response similar to Fig. 12.
30.	"	"	545MC (10MC Swp)	550MC	"	"	Tracking screws (Pair#7)	Set ribbons to 2 7/16". Adjust for response similar to Fig. 12.
31.	"	"	507MC (10MC Swp)	512MC	"	"	Tracking Screws (Pair#8)	Set ribbons to 2 1/16". Adjust for response similar to Fig. 12.
32	"	"	478MC (10MC Swp)	483.5MC	"	"	Tracking screws (Pair#9)	Set ribbons to 1 11/16". Adjust for response similar to Fig. 12.
33.	"	"	455MC (10MC Swp)	460MC	"	"	Tracking screws (Pair #10)	Set ribbons to 1 3/8". Adjust for response similar to Fig. 12.

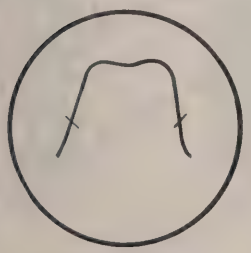


FIG.9

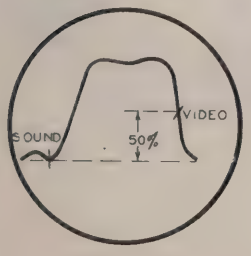


FIG.10

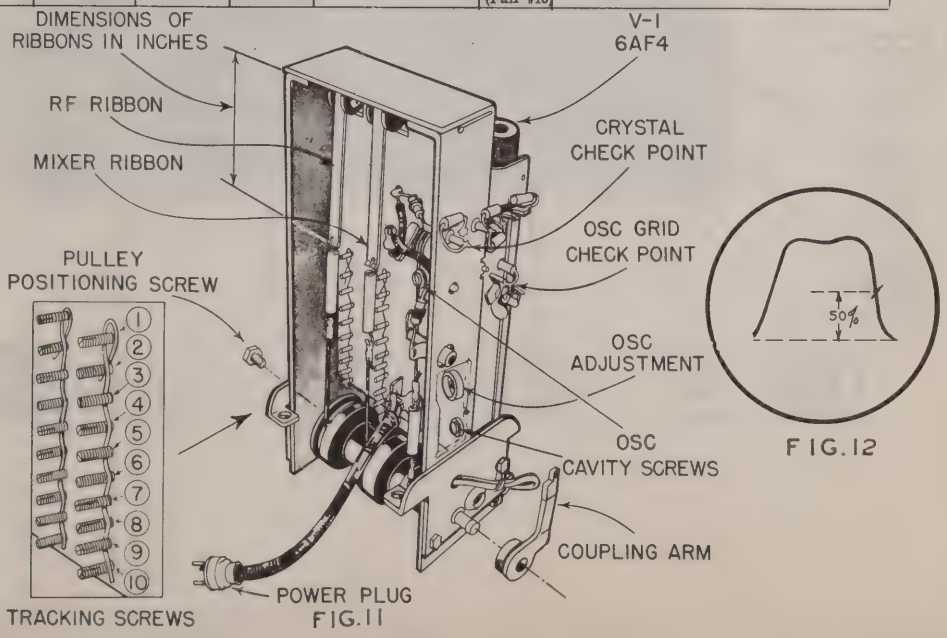
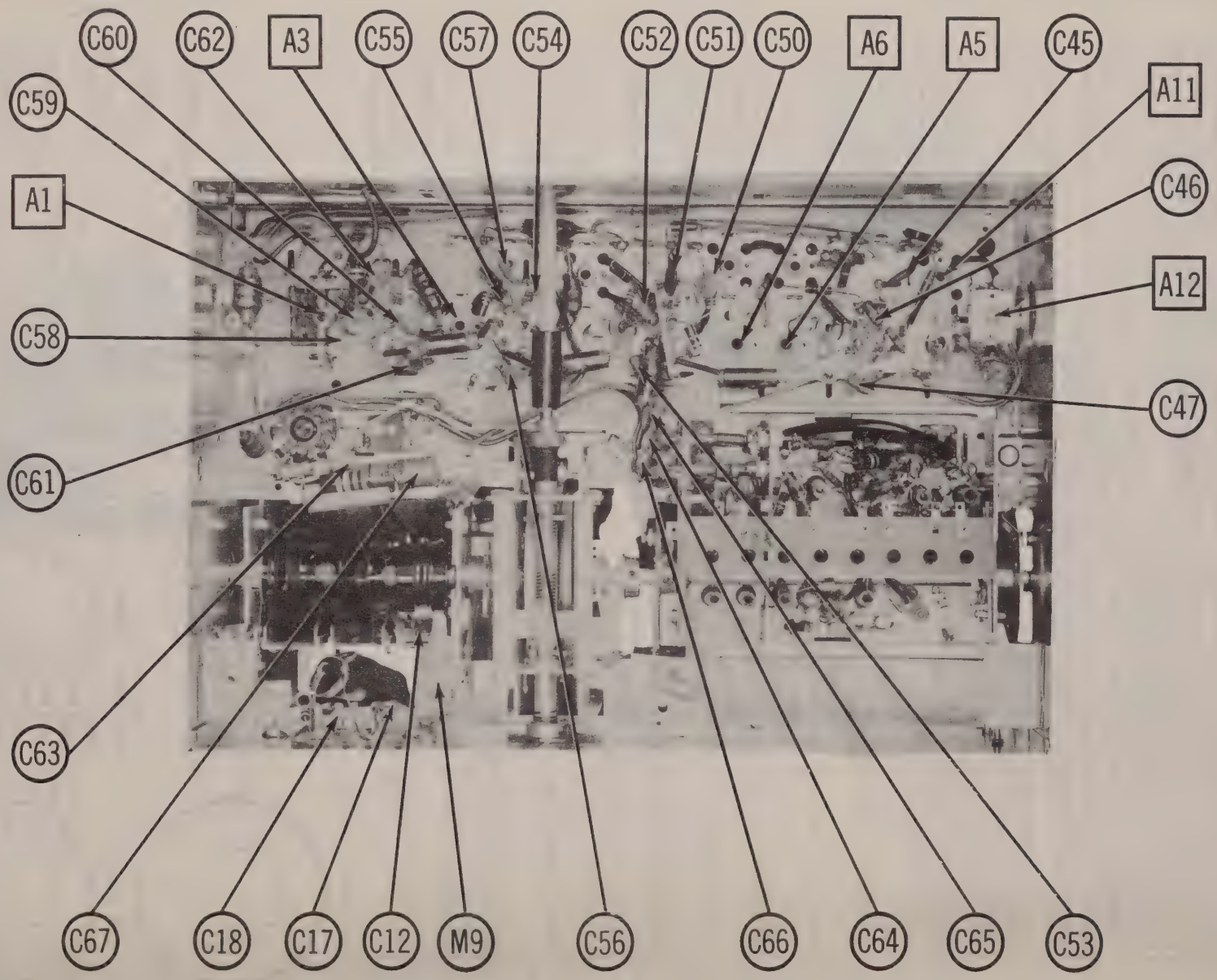


FIG.11

FIG.12

RAYTHEON MODELS UC-2139A, UC-2141A, UC-2142A, UC-2144A, UC-2145A, UM-2133A, UM-2134A, UM-2135A, UM-2136A

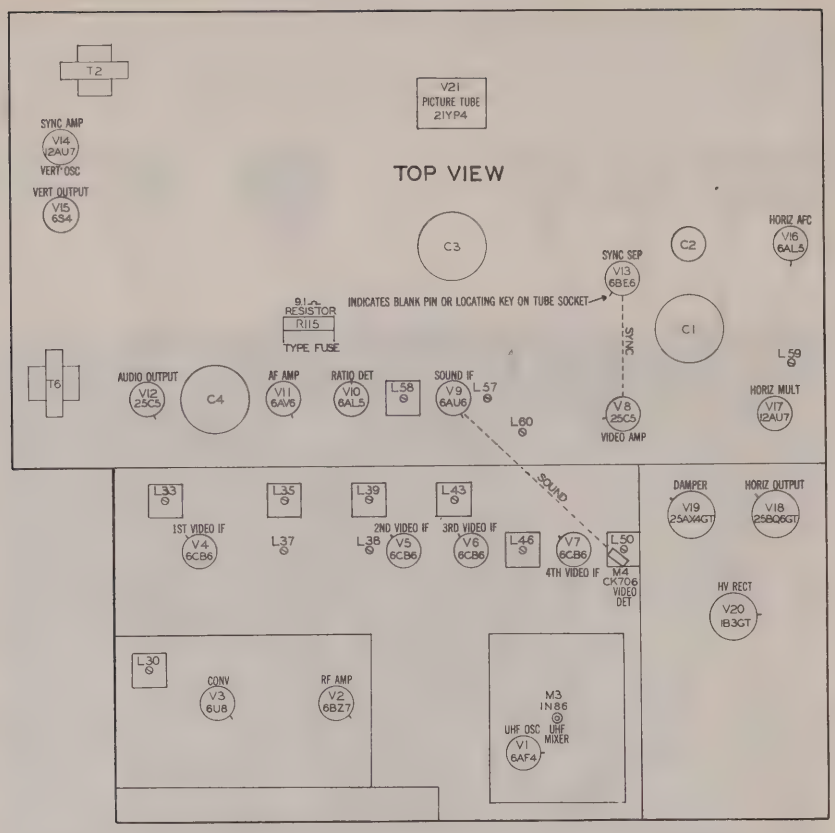


RF-IF CHASSIS- BOTTOM VIEW CAPACITOR AND ALIGNMENT IDENTIFICATION

PROPERTY OF
L. F. BLANKENSHIP
[illegible] GRADE ST.
DENVER, COLORADO

RF-IF CHASSIS- BOTTOM VIEW RESISTOR AND INDUCTOR IDENTIFICATION

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

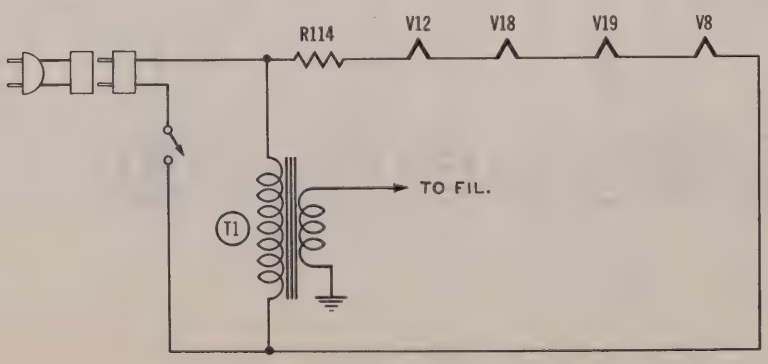
POWER SUPPLY FAILURE
No raster, no sound - **Selenium Rectifiers (M1, M2)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V3, V4, V5, V6, V7, V8, V12 (V1 UHF only)**
No pic, no sound, has snow - **V2, V3, V4**
No pic, has sound, has raster - **V8, V21**
Has pic, no sound - **V9, V10, V11, V12**

SYNC FAILURE
No vert. sync - **V14**
No horiz. sync - **V14, V16, V17**
No vert. or horiz. sync - **V13, V14**

SWEEP FAILURE
No raster, has sound - **V17, V18, V19, V20**
No vertical deflection - **V14, V15**
Poor vert. linearity or foldover - **V14, V15**
Poor horiz. linearity or foldover - **V17, V18, V19, V20, V21**
Narrow picture - **V17, V18, V19, V20, M1, M2**
Vert. off freq. - **V14**
Horiz. off freq. - **V14, V16, V17**

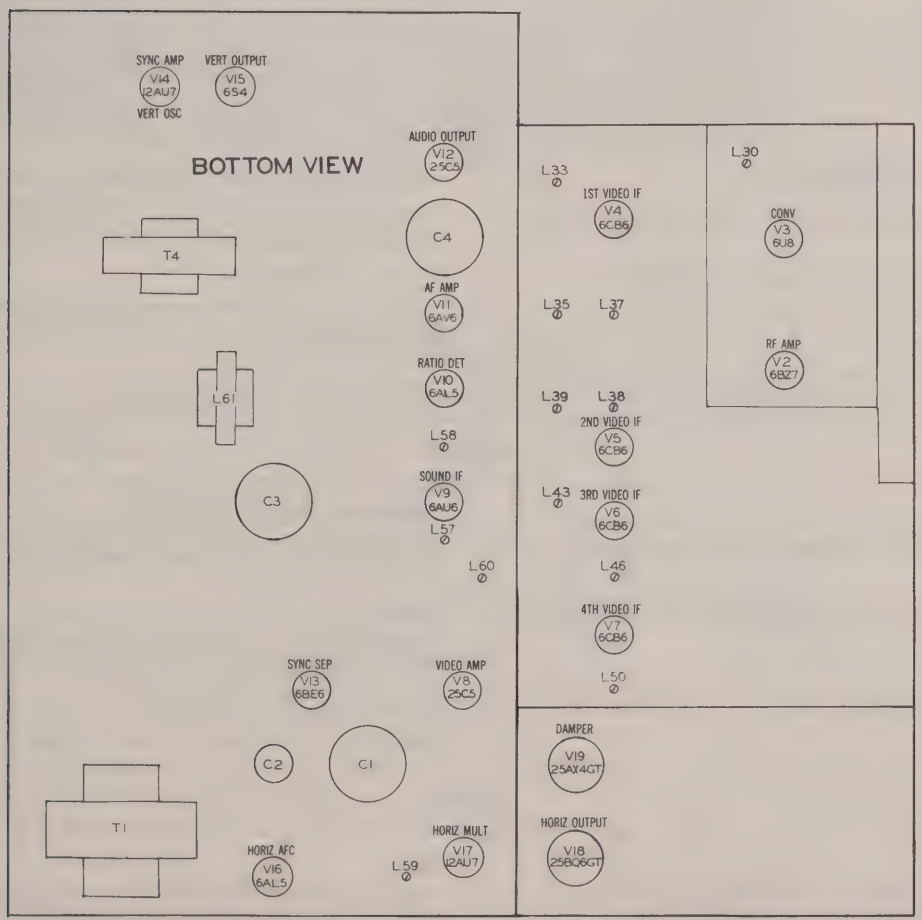
Since this receiver employs tubes used in series-parallel filament network , an open filament in any tube in series may cause the set to be inoperative. (See circuit below.)



RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AF4	†■8KΩ	4.7KΩ	.1Ω	0Ω	0Ω	4.7KΩ	†■8KΩ		
V 2	6BZ7	INF	1Meg	0Ω	.1Ω	0Ω	†1.1KΩ	INF	INF	0Ω
V 3	6U8	†1.6KΩ	240KΩ	†43KΩ	.1Ω	0Ω	†10KΩ	0Ω	2.2KΩ	12KΩ
V 4	6CB6	1Meg	82Ω	0Ω	.1Ω	†3.6KΩ	†2.6KΩ	0Ω		
V 5	6CB6	1Meg	68Ω	0Ω	.1Ω	†2.6KΩ	†2.6KΩ	0Ω		
V 6	6CB6	1Meg	47Ω	0Ω	.1Ω	†2.6KΩ	†2.6KΩ	0Ω		
V 7	6CB6	2.2Ω	180Ω	.1Ω	0Ω	†5.7KΩ	†10KΩ	0Ω		
V 8	25L5	280Ω	3.9KΩ	♦0Ω	♦25Ω	3.9KΩ	†150KΩ	†7.3KΩ		
V 9	6AU6	100KΩ	0Ω	.1Ω	0Ω	†8.3KΩ	†8.3KΩ	120Ω		
V 10	6AL5	22KΩ	0Ω	.1Ω	0Ω	INF	0Ω	INF		
V 11	6AV6	10Meg	0Ω	0Ω	.1Ω	0Ω	0Ω	†470KΩ		
V 12	25C5	120Ω	470KΩ	♦75Ω	♦100Ω	470KΩ	†2.5KΩ	†2.3KΩ		
V 13	6BE6	70KΩ	0Ω	0Ω	.1Ω	†70KΩ	†47KΩ	1.5Meg		
V 14	12AU7	†55KΩ	†2.2Meg	0Ω	.1Ω	.1Ω	▲510KΩ	7.2Meg	0Ω	0Ω
V 15	6S4	INF	2.8KΩ	2.2Meg	0Ω	.1Ω	2.2Meg	INF	INF	▲11KΩ
V 16	6AL5	150KΩ	2.2Meg	0Ω	.1Ω	4.5Meg	0Ω	2.2Meg		
V 17	12AU7	†10.1KΩ	4.9Meg	2.2KΩ	0Ω	0Ω	†150KΩ	200KΩ	2.2KΩ	.1Ω
V 18	25BQ6G	INF	♦50Ω	2.5Ω	†4.8KΩ	470KΩ	470KΩ	♦75Ω	0Ω	TOP CAP ▲9.6Ω
V 19	25AX4GT	INF	INF	550KΩ	INF	†70Ω	INF	♦50Ω	♦25Ω	
V 20	1B3GT		PINS	1 - 8	HAVE	INF	RESISTANCE			TOP CAP ▲275Ω
V 21	21YP4	0Ω	27.5KΩ	PIN 6 †70Ω	PIN 10 ▲11KΩ	PIN 11 †130KΩ	PIN 12 .1Ω			

† MEASURED FROM OUTPUT OF M1
■ MEASURED IN UHF POSITION
♦ MEASURED FROM COLD SIDE OF OFF/ON SWITCH
▲ MEASURED FROM PIN 3 OF V19



TUBE PLACEMENT CHART

SET 239 FOLDER 7

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

TROUBLE SHOOTING AIDS

CAUTION

Use a line isolation transformer to remove shock hazzard and prevent damage to receiver and/or test equipment.

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check horizontal size adjustment. Check by substitution V18 and V19. Check waveform W14.

If Satisfactory	If Unsatisfactory
Check R110, R111, C108, T3, T5A and other associated components.	Check R107, R109, C106, C107 and other associated components.

DRIVE LINES

Check horizontal size adjustment. Check by substitution V17, V18 and V19. Check R107, R109, R110, R111, C106, C107, C108, T3, T5A and other associated components. Check high voltage power plug for proper seating.

COMPRESSED AT LEFT SIDE

Check horizontal size adjustment. Check by substitution V18, V19 and V17. Check components associated with stages especially T3, and T5A.

FOLDS

Follow procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Check by substitution V17, V18 and V19. Check C99 for open. Check T3, T5A and other associated components for high voltage ARC-over.

XMAS TREE EFFECT

Substitute V17. Check L59, C100, C101, C102 and other associated components for failure or change of value.

VERTICAL

LOSS OF SWEEP

Check by substitution V14 and V15. Check waveform W8.

If Satisfactory	If Unsatisfactory
Check T4, T5B, R4 and other associated circuit components.	Check T2, C91, R5, R91 and other associated circuit components.

INSUFFICIENT SWEEP

Check adjustment of height and vertical linearity controls. Proceed as outlined under "Loss of Sweep".

COMPRESSED AT BOTTOM

Check by substitution V14 and V15. Check T4, T5B, C3C and other associated circuit components.

COMPRESSED AT TOP

Check by substitution V14 and V15. Check C91, R91 and other associated components.

FOLDS

Substitute V14 and V15. Check components associated with V14B and V15 for failure or change of value.

SYNC

LOSS OF VERTICAL AND HORIZONTAL SYNC

Check by substitution V13 and V14. Check adjustment of sync stabilizer control. Check components associated with V13 and V14A for failure or change of value.

LOSS OF VERTICAL SYNC-HORIZONTAL SYNC SATISFACTORY

Check by substitution V13 and V14. Check waveform W6.

If Satisfactory	If Unsatisfactory
Check components associated with V14B.	Check vertical integrator and other associated components.

LOSS OF HORIZONTAL SYNC-VERTICAL SYNC SATISFACTORY

Check adjustment of sync stability control. Check by substitution V16 and V17. Check C98, C99, C100, C93, C102, C94, C96, R105, R106, R101, R102, R103, R107, R84, R85, L59 and other associated components.

HORIZONTAL BENDING

Check adjustment of sync stability control. Check by substitution V13, V14, V16 and V17. Check R112, R107, R105, R106, C94, C96, C98, C99, C5 and other associated components.

VIDEO

LOSS OF VIDEO

Substitute V8. Check picture tube and other associated components.

SOUND BARS

Adjust tuner, tuning control for best picture and sound. Check V4, V5, V6, V7, V2, V3, V8, V14 and V15 for microphonoics.

POOR CONTRAST

Substitute V8. Check video detector assembly. Check picture tube and other associated components.

OVERLOADED OR NEGATIVE PICTURE

Check by substitution V4, V5, V6, V7, V8, video detector crystal and V2. Check associated circuit components including C45, C50, C65, C51, C54, C23, C83, R53, R75 and R6.

SMEAR

Check by substitution V8, V7, V6, V5 and V4. Check video detector crystal. Check R57, R58, R53, R6, C3B, C68, C69, L51, L52, L54, L55, L56, picture tube and other associated components.

WIDE BLACK BAR ACROSS PICTURE

Check V2, V4, V5, V6, V7 and V8 for heater to cathode leakage.

AUDIO

WEAK OR NO SOUND

Check by substitution V9, V10, V11 and V12. Check stages of V11 and V12 using audio signal generator. Apply audio signal across R71.

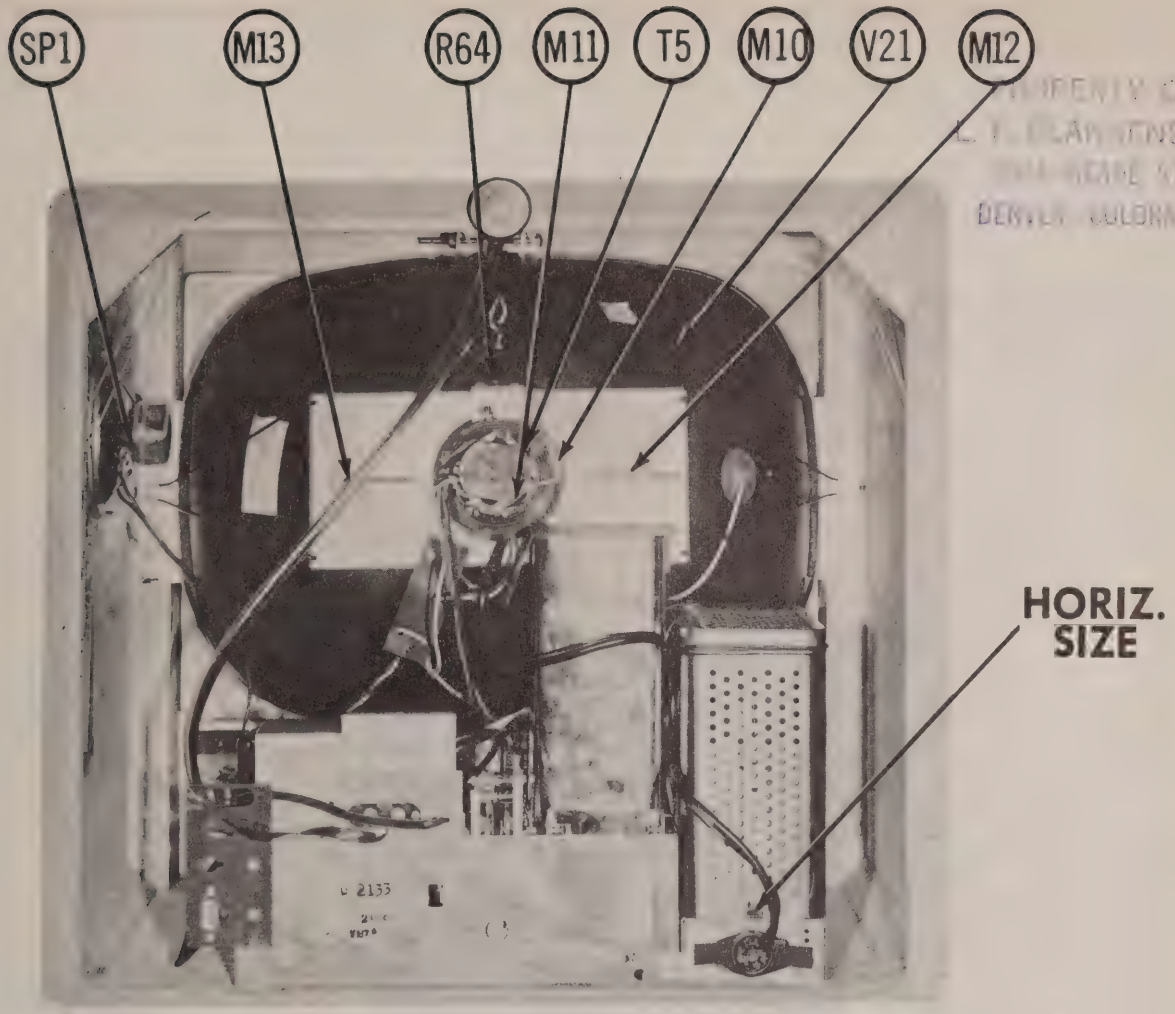
If Satisfactory	If Unsatisfactory
Check ratio detector and audio IF alignment and components.	Check components associated with V11 and V12 especially C80. and T6.

BUZZ

Adjust station tuning for best picture and sound. Adjust A15 for minimum buzz. If buzz is still objectionable, substitute V10 and realign audio IF and ratio detector stages.

DISTORTED

Follow procedure outlined under "Weak or No Sound".



PROPERTY OF
U. S. GOVERNMENT
DENVER, COLORADO

CABINET—REAR VIEW

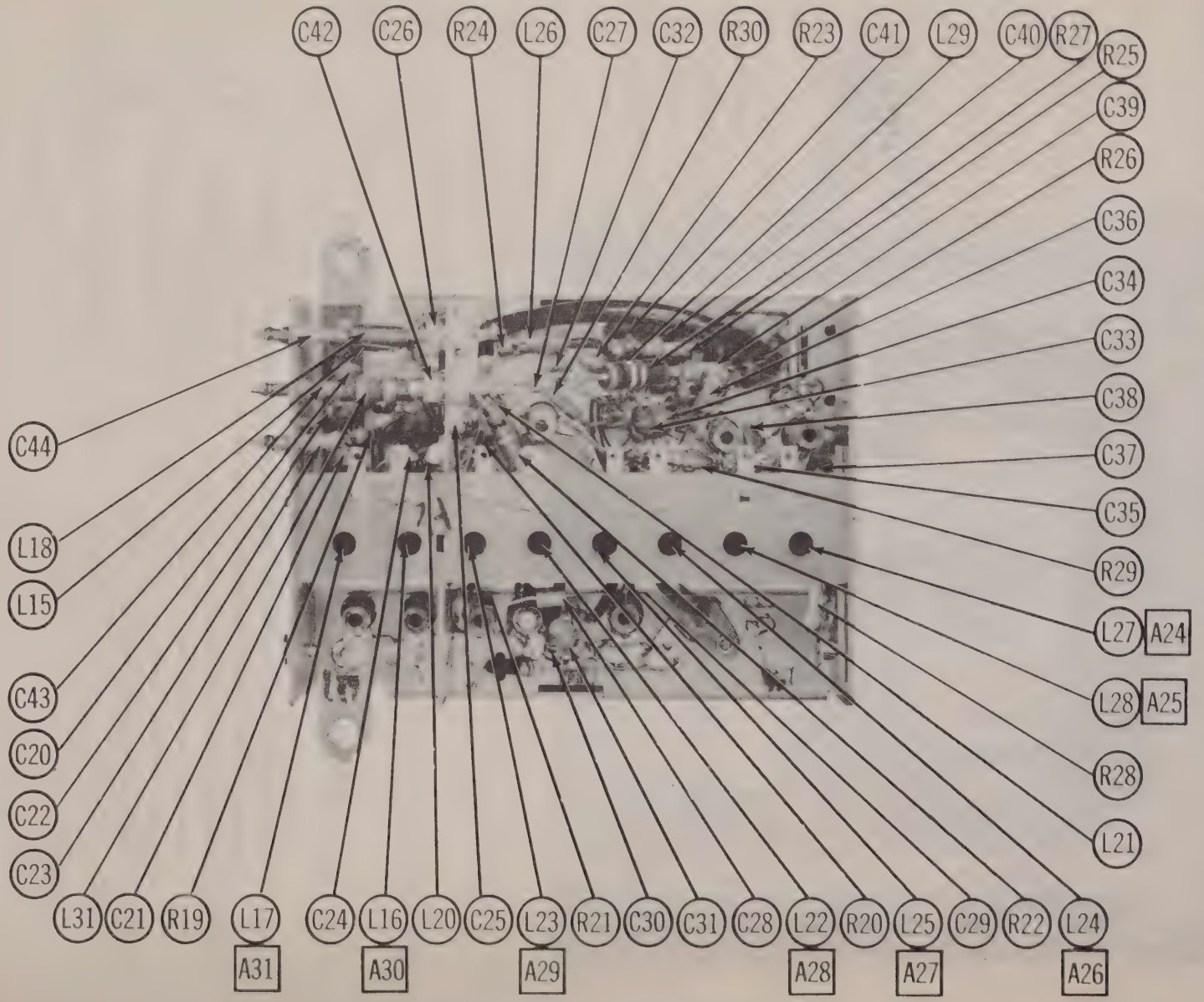
HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Set the horizontal hold control to the center of its range. Adjust the horizontal oscillator slug (B1) until picture synchronizes. Continue turning B1 in same direction until picture just loses sync then back off to a point approximately in the center of the effective range of B1. Momentairly interrupt signal by switching off channel and back again. Picture should remain in sync. If necessary readjust B1 until this condition is obtained.

Adjust the horizontal size control for a picture slightly wider than necessary to fill the picture mask horizontally.

Adjust the sync stabilizer control for the most stable picture.



VHF TUNER-BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

PROPERTY OF
L. F. BANKENSHIP
3024 MEADE ST.
DENVER, COLORADO

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: RAYTHEON PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	UHF Oscillator	6AF4	6AF4	7DK	
V2	VHF RF Amp.	6BZ7	6BZ7	9AJ	
V3	Converter	6U8	6U8	9AE	
V4	1st. Video IF Amp.	6CB6	6CB6	7CM	
V5	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V6	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V7	4th. Video IF Amp.	6CB6	6CB6	7CM	
V8	Video Output	25C5	25C5	7CV	
V9	Sound IF Amp.	6AU6	6AU6	7BK	
V10	Ratio Detector	6AL5	6AL5	6BT	
V11	AF Amplifier	6AV6	6AV6	7BT	
V12	Audio Output	25C5	25C5	7CV	
V13	Sync Separator	6BE6	6BE6	7CH	
V14	Sync Amplifier-Vert. Oscillator	12AU7	12AU7	9A	
V15	Vert. Output	6S4	6S4	9AC	
V16	Horiz. AFC	6AL5	6AL5	6BT	
V17	Horiz. Mult.	12AU7	12AU7	9A	
V18	Horiz. Output	25BQ6GT	25BQ6GT	6AM	
V19	Damper	25AX4GT	25AX4GT	4CG	
V20	HV Rectifier	1B3GT	1B3GT	3C	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: RAYTHEON PART No.	SYLVANIA PART No.	GENERAL ELECTRIC PART No.	WESTINGHOUSE PART No.	RETMA BASE TYPE	NOTES
V21	21YP4	21YP4 21YP4A ①	21YP4 21YP4A ①	21YP4 21YP4A ①	12L 12L	① Aluminized

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: RAYTHEON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1	100	150	8C-22286	AFHS1-69		XA003		FP116	TVL-1423	
C2	100	150	8C-22285	AFHS1-69		XA003		FP116	TVL-1423	
C3A	▲100	300	8C-22523	AFH3-24		D002		FP335	TVL-3574	
B	■10	300		PRS50/50		BR505				
C	▲60	50								
C4A	■20	300	8C-22524	AFH3-106		C026		FP330.3	TVL-3634	
B	10	25						TC30		
C	▲10	75								
C5	50	450	8C-22544	PRS450/50		BR6045		TC78	TVA-1713	
C6	5			SI5NP0	TCZ-4.7	TZ07	NP0K-050	ZT-555	5TCCB-V47	Note 1
C7	5			SI5NP0	TCZ-4.7	TZ07	NP0K-050	ZT-555	5TCCB-V47	Note 1
C8	1000		8G-22383	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C9	1000		8G-20878							
C10A	1000		8G-19506	BPD-2X001	DD2-102	DK069	812-001	DCD-521	5HK-2D1	
B	1000									
C11	1000		8G-22120							
C12	1000		8G-22383	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C13	20		8G-21315							
C14	1000		8G-20878							
C15	100		201-22887	SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C16	6		8G-20880							
C17	1000		8G-22656	SI1000	D6-102	TP52	GP2L-102	UC-521	5HK-D1	
C18	1000		8G-22656	SI1000	D6-102	TP52	GP2L-102	UC-521	5HK-D1	
C19	1000		8G-22656	SI1000	D6-102	TP52	GP2L-102	UC-521	5HK-D1	
C20	100		8G-19862	SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C21	20		8G-22276	SI20NP0	TCZ-20	TZ1.3	NP0K-200	ZT-542	5TCC-Q2	
C22	20		8G-22276	SI20NP0	TCZ-20	TZ1.3	NP0K-200	ZT-542	5TCC-Q2	
C23	1000		8G-20878	EF-001	MFT-1000				503C-D1	
C24	3		8G-22772							
C25	1000									
C26	1000									
C27	.68		8G-12495-1		TCZ-.68	TZ02				
C28	1.7		8G-12495-8							
C29	1000		8G-13201	SI1000	D6-102	TP52	GP2L-102	UC-521	5GA-D1	
C30	10		8G-11789	SI10NP0	TCZ-10	TZ09	NP0K-100	ZT-541	5TCC-Q1	
C31	1000		8G-13201	SI1000	D6-102	TP52	GP2L-102	UC-521	5HK-D1	
C32	1000		8G-20878	EF-001	MFT-1000				503C-D1	
C33	2.2		8G-12495-4	SI2.2NP0	TCZ-2.2	TZ05	NP0K-2R2		5TCCB-V22	
C34	1000		8G-13201	SI1000	D6-102	TP52	GP2L-102	UC-521	5HK-D1	
C35	18		8G-22227		TCZ-18	TZ-12	NP0K-180			
C36	2.5		8G-22367							
C37	2.5		8G-19568							
C38	1000		8G-22383	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C39	1000		8G-13201	SI1000	D6-102	TP52	GP2L-102	UC-521	5HK-D1	
C40	1000		8G-13201	SI1000	D6-102	TP52	GP2L-102	UC-521	5HK-D1	
C41	330		8G-17349	SI330	D6-331	TP43	GP2K-331	UC-5333	5GA-T33	
C42	1000									
C43	1000		8G-20878	EF-001	MFT-1000				503C-D1	
C44	1000		8G-20878	EF-001	MFT-1000				503C-D1	
C45	5000		8G-13962	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C46	680		8G-21105	SI680	D6-681	TP50	GP2K-681	UC-5368	5GA-T68	
C47	1000		8G-13201	SI1000	D6-102	TP52	GP2L-102	UC-521	5HK-D1	
C48	5		8G-12166	SI5NP0	TCZ-4.7	Z011	NP0-831-050	ZT-555	5TCCB-V47	
C49	7		8G-11790			Z014	NP0-831-050			
C50	5000		8G-13962	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C51	5000		8G-13962	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C52	680		8G-21105	SI680	D6-681	TP50	GP2K-681	UC-5368	5GA-T68	
C53	1000		8G-13201	SI1000	D6-102	TP52	GP2L-102	UC-521	5HK-D1	
C54	5000		8G-13962	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C55	680		8G-21105	SI680	D6-681	TP50	GP2K-681	UC-5368	5GA-T68	
C56	1000		8G-13201	SI1000	D6-102	TP52	GP2L-102	UC-521	5HK-D1	

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	RAYTHEON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C57	5000		8G-13962	BPD-008	DD-502	K080	41-005	DC-525	5HK-D5	
C58	5000		8G-13962	BPD-008	DD-502	K080	41-005	DC-525	5HK-D5	
C59	5000		8G-13962	BPD-005	DD-502	K080	41-005	DC-525	5HK-D5	
C60	5000		8G-13962	BPD-008	DD-502	K080	41-005	DC-525	5HK-D5	
C61	1000		8G-13301	BU1000	D5-102	P352	GP2L-102	UC-531	5HK-D1	
C62	5000		8G-13962	BPD-005	DD-502	K080	41-005	DC-525	5HK-D5	
C63	5000		8G-13962	BPD-008	DD-502	K080	41-005	DC-525	5HK-D5	
C64	5000		8G-13962	BPD-005	DD-502	K080	41-005	DC-525	5HK-D5	
C65	5000		8G-13962	BPD-005	DD-502	K080	41-005	DC-525	5HK-D5	
C66	5000		8G-13962	BPD-005	DD-502	K080	41-006	DC-525	5HK-D5	
C67	.047	400	8J-16041	P488-047	DF-503	CUB4S47		PT4147	47M-S47	
C68	5000		8G-13962	BPD-005	DD-502	K080	41-005	DC-525	5HK-D5	
C69	.1	400	8J-16063	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C70	100			SU100	D5-101	TP54	GP1K-101	UC-531	5GA-T1	Note 2
C71	3.3			SD3.3NP0	TCZ-3.3	TZ06	NP0K-3R3	ZT-5533	57CCD-V33	Note 3
C72	22			SD22NP0	TCZ-22	TZ14	NP0K-220	ZT-5422	57CC-Q22	Note 2
C73	47		8G-12198	SM47N750	TCM-47	TM16	M750K-470	NT-5447	57CU-Q47	
C74	.0022	400	8J-20634	P688-0022	DD-222	CUB6D22	GP2-333-222	PT6222	6TM-D22	
C75	5000		8G-13962	BPD-005	DD-502	K080	41-005	DC-525	5HK-D5	
C76	5000		8G-13962	BPD-005	DD-502	K080	41-005	DC-525	5HK-D5	
C77	5000		8G-22132	SU5000	D5-502	TP54	GP2-333-502	UC-525	5HK-D5	
C78	.01	200	8J-20582	P488-01	D6-103	CUB4S1	GP2-333-103	PT4U	4TM-S1	
C79	.01	200	8J-20582	P488-01	D6-103	CUB4S1	GP2-333-103	PT4U	4TM-S1	
C80	.01	400	8J-16084	P488-01	D6-103	CUB4S1	GP2-333-103	PT4U	4TM-S1	
C81	.01	600	8G-21208	P688-01	D6-103	CUB6S1	GP2-333-103	PT6U	6TM-S1	
C82	.047	400	8J-16081	P488-047	DF-503	CUB4S47		PT4167	47M-S47	
C83	.22	300	8J-16063	P488-22		CUB4P23		PT4026	4TM-P23	
C84	.1	200	8J-16085	P288-1	DF-104	CUB2P1		PT401	2TM-P1	
C85	.022	400	8J-19757	P488-023		CUB4S22		PT4122	4TM-S22	
C86	.22	400	8J-16095	P488-22		CUB4P23		PT4023	4TM-P23	
C87A	.002			*17A-22376	*PA-110	*PC-100	*1157M1	*1405-01	PT625	*101C1
B	.005								PT626	
C	.005								PT627	
C88	.0047	200	8J-20580	P688-0047	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C89	.047	400	8J-16081	P488-047	DF-503	CUB4S47		PT4147	4TM-S47	
C90	.047	200	8J-16096	P488-047	DF-503	CUB2S47		PT2147	2TM-S47	
C91	.1	400	8J-16083	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C92	.01	600	8J-16097	P688-01	D6-103	CUB6S1	GP2-333-103	PT6U	6TM-S1	
C93	22		8G-11892	SD22N750	TCN-22	TN08	N750K-220	NT-5422	57CU-Q22	
C94	220	500	8J3-117			2SR5G22				
C95	680	500	8J3-123	1479-0007		1R5T68			M3-37	
C96	220	500	8J3-117			2SR5G22				
C97	680	500	8J3-123	1479-0007		1R5T68			M3-37	
C98	.1	200		P288-1	DF-104	CUB2P1		PT401	2TM-P1	Note 4
C99	.0022	200	8J-20578	P688-0022	D6-222	CUB6D22	GP2-333-222	PT6222	6TM-D22	
C100	.0039	600	8J-20613	1464-004		1R5D39		MCB463	M3-24	
C101	62	500	8J3-122			2SR5Q62				
C102	330	500	8J3-119			2SR5T33				
C103	22	400		P488-22		CUB4P23		PT4022	4TM-P23	Note 5
C104	100			SU100	D6-101	TP54	GP1K-101	UC-531	5GA-T1	Note 2
C105	47		8G-19863							
C106	470	500	8J3-121	1469-0005		5R5T47		MCB345	M3-35	
C107	.0015	400	8J-20589	P688-0015	D6-152	CUB6D15	GP2L-152	PT6215	6TM-D15	
C108	.047	400	8J-16081	P488-047	DF-503	CUB4S47		PT4147	4TM-S47	
C109	.22	400		P488-22		CUB4P23		PT4022	4TM-P22	Note 5
C110	470	1000	8G-21440	HVD15-00047		VT47	IR5KV-471	MCK347	10GA-T47	
C111	.1	200		P288-1	DF-104	CUB2P1		PT401	2TM-P1	Note 4
C112	51									
C113	100	500		1469-0001		5R5T1		MCB235	M3-31	Note 2

Note 1. Some Models use 100MMF in this application (part #8G-22667)
Note 2. Not used in all Models.
Note 3. Some Models use 5MMF in this application (part #8G-12188).
Note 4. Some Models use .22MFD in this application (part #8J-16082).
Note 5. Some Models use .47MFD in this application (part #8J-21505).
• Items C87A, C87B, C87C, R86A, R86B, R86C are combined in one unit.

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	RAYTHEON PART No.	IRC PART No	CLAROSTAT PART No	CENTRALAB PART No	MALLORY PART No	INSTALLATION NOTES
R1A	100KΩ	½	B10B-17375	QU-129	A47-100K-S	AB-40	U-41	Horiz. Hold
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R1A
R2A	500KΩ	½	B-10B-21456	QU-133	A47-500K-S	AB-59	U-50	Brightness
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R2A
R3A	1 Meg	½	A-10A-22305	Q13-157	A47-1Meg-S	BSK-70-S	U-53	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R3A
C	Switch		Not Req.	76-1	SWZ-12	Not Req.	US-26	Attach to R3A
R4A	5000Ω with 1000Ω stop	½	A-10B-22304	QU-114	A47-5000-S	AB-10	U-14	Vert. Linearity - Note 1
B	Shaft		Not Req.	Not Req.	KS-3	AK- 4	Not Req.	Attach to R4A
R5A	750KΩ with 250K stop	½	A-10B-22307	QU-133	A47-500K-S			Vert. size - Note 2
B	Shaft		Not Req.	Not Req.	KS-2			Attach to R5A
R6	250Ω	2	A-10B-22311	QU-111				Picture - wire wound
R7A	3 Meg	½	B10B-17318	QU-140	A47-2.5Meg-S	AB-84	U-57	Sync stabilizer
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R7A
R8A	3 Meg	½	B10B-17318	QU-140	A47-2.5Meg-S	AB-84	U-57	Vert. hold
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R8A

Note 1. Connect a 1000Ω resistor in series with the right hand terminal of the control and the lead connecting to the same terminal of the original control. (Control viewed from shaft end, terminals down)

Note 2. Connect a 250KΩ resistor in series with the left hand terminal of the control and the lead connecting to the same terminal of the original control. (Control viewed from shaft end, terminals down)

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	RAYTHEON PART No.	IRC PART No.	NOTES
R9	470 KΩ	½	9S1-29	BTS-470K	
R10	220	½	9S1-43	BTS-22	
R11	15Ω	½	9S1-40	BTS-15	
R12	56Ω	½	9S1-47	BTS-56	
R13	4700Ω	½	9S1-70	BTS-4700	
R14	22Ω	½	9S1-42	BTS-22	
R15	56Ω	½	9S1-47	BTS-56	
R16	56Ω	½	9S1-47	BTS-56	
R17	220Ω	½	9S1-54	BTS-220	
R18	470KΩ	½	9S1-29	BTS-470K	
R19	10KΩ	½	9S1-74	BTS-10K	
R20	100KΩ	½	9S1-88	BTS-100K	
R21	10Ω	½	9S1-38	BTS-10	
R22	1000Ω	½	9S1-82	BTS-1000	
R23	22KΩ	½	9S1-78	BTS-22K	
R24	220KΩ	½	9S1-27	BTS-220K	
R25	33KΩ	½	9S1-80	BTS-33K	
R26	27KΩ	½	9S1-79	BTS-27K	
R27	10KΩ	½	9S2-74	BTA-10K	
R28	10KΩ	½	9S1-74	BTS-10K	
R29	2200Ω	½	9S1-66	BTS-2200	
R30	1500Ω	½	9S1-14	BTS-1500	
R31	1000Ω	½	9S4-78	BTS-22K	
R32	13KΩ	2	9S4-75	BTB-13K	Note 1
R33	22KΩ	½	9S1-78	BTS-22K	
R34	6800Ω	½	9S1-72	BTS-6800	
R35	1000Ω	½	9S1-82	BTS-1000	
R36	82Ω	½	9S1-49	BTS-82	
R37	1000Ω	½	9S1-82	BTS-1000	
R38	1000Ω	½	9S1-82	BTS-1000	
R39	47KΩ 5%	½	9S1-199	BTS-47K 5%	
R40	100KΩ	½	9S1-62	BTS-100K	
R41	68Ω	½	9S1-48	BTS-68	
R42	27KΩ 5%	½	9S1-193	BTS-27K 5%	
R43	1000Ω	½	9S1-82	BTS-1000	
R44	1000Ω	½	9S1-82	BTS-1000	
R45	47Ω	½	9S1-46	BTS-47	
R46	47KΩ 5%	½	9S1-199	BTS-47K 5%	
R47	1000Ω	½	9S1-82	BTS-1000	
R48	180Ω	½	9S1-53	BTS-180	
R49	22KΩ	½	9S2-78	BTA-22K	
R50	10KΩ	1	9S2-74	BTA-10K	
R51	15KΩ 5%	½	9S1-187	BTS-15K 5%	
R52	5600Ω	½	9S1-71	BTS-5600	
R53	3900Ω	½	9S1-69	BTS-3900	
R54	10KΩ	½		BTS-10K	Note 6
R55	150KΩ	½	9S1-88	BTS-150K	Note 2
R56	15KΩ	½	9S1-78	BTS-15K	
R57	3300Ω	2	9S4-68	BTB-3300	
R58	3300Ω	2	9S4-68	BTB-3300	Note 3
R59	4700Ω	½	9S1-70	BTS-4700	Note 4
R60	100KΩ	½	9S1-88	BTS-100K	
R61	22KΩ	½	9S1-85	BTS-22K	Note 3
R62	5600Ω	½		BTS-5600	Note 4
R63	1000Ω	½	9S1-82	BTS-1000	
R64	220KΩ	½		BTS-220K	

ITEM No.	RATING OHMS	RATING WATT	RAYTHEON PART No	IRC PART No.	NOTES
R65	100KΩ	½	9S1-88	BTS-100K	
R66	120Ω	½	9S1-51	BTS-120	
R67	8200Ω	2	9S4-73	BTB-8200	
R68	47Ω	½	9S1-46	BTS-47	
R69	22KΩ	½	9S1-78	BTS-22K	
R70	22KΩ	½	9S1-78	BTS-22K	
R71	10 Meg	½	9S1-110	BTS-10 Meg	
R72	470KΩ	½	9S1-94	BTS-470K	Note 5
R73	470KΩ	½	9S1-94	BTS-470K	
R74	120Ω	½	9S2-51	BTA-120	
R75	1 Meg	½	9S1-98	BTS-1 Meg	
R76	1 Meg	½	9S1-98	BTS-1 Meg	
R77	68KΩ	½		BTS-68K	
R78	1.5 Meg	½	9S1-100	BTS-1.5Meg	
R79	47KΩ	2	9S4-83	BTB-47K	
R80	15KΩ	½	9S1-76	BTS-15K	
R81	18KΩ	½	9S1-77	BTS-18K	
R82	47KΩ	½	9S1-82	BTS-47K	
R83	2.2 Meg	½	9S1-102	BTS-2.2Meg	
R84	100KΩ	½	9S1-88	BTS-100K	
R85	100KΩ	½	9S1-85	BTS-100K	Note 7
R86A	22KΩ	½		BTS-22K	
B	8200Ω	½	417A-22376	BTS-8200	
C	8200Ω	½		BTS-8200	
R87	100KΩ	½	9S1-88	BTS-100K	
R88	3.3Meg	½	9S1-103	BTS-3.3Meg	
R89	6.8Meg	½	9S1-108	BTS-6.8Meg	
R90	100KΩ	½	9S1-88	BTS-100K	
R91	2.2Meg	½	9S1-102	BTS-2.2Meg	
R92	180KΩ	½	9S2-69	BTA-180K	
R93	1000Ω	½	9S1-82	BTS-1000	
R94	1000Ω	½	9S1-82	BTS-1000	
R95	150KΩ	½	9S1-88	BTS-150K	
R96	2.2Meg	½	9S1-102	BTS-2.2Meg	
R97	150KΩ	½	9S1-88	BTS-150K	
R98	2.2Meg	½	9S1-102	BTS-2.2Meg	
R99	470KΩ	½	9S1-94	BTS-470K	
R100	68KΩ	½	9S1-84	BTS-68K	
R101	2200Ω	½		BTS-2200	
R102	10KΩ	½	9S2-74	BTA-10K	
R103	150KΩ	½	9S1-88	BTS-150K	
R104	330KΩ	½		BTS-330K	
R105	680KΩ	½	9S1-96	BTS-680K	
R106	680KΩ	½	9S1-96	BTS-680K	
R107	150KΩ	½	9S1-88	BTS-150K	
R108	100Ω	½	9S1-50	BTS-100	
R109	470KΩ	½	9S1-94	BTS-470K	
R110	4700Ω	2	9S4-70	BTB-4700	
R111	180KΩ	½	9S2-69	BTA-180K	Note 8
R112	10KΩ	2	9S4-74	BTB-10K	
R113	5.6Ω	½			
R114	47Ω	16	9M-22837		Note 8
R115	9.1Ω		46M-22301		
R116A	1500Ω	10	9M-22275		
B	2200Ω	10			
R117	3.9Ω	½	9C1-1070		

Note 1. Some models may use a 32KΩ resistor in this application.
Note 2. Some models may use a 47KΩ resistor in this application.
Note 3. Some models may use a 1800Ω resistor in this application.
Note 4. Some models may use a 3300Ω resistor in this application.
Note 5. Some models may use a 220KΩ resistor in this application.
Note 6. Not used in all models.
Note 7. Some models may use a 47KΩ resistor in this application.
Note 8. Models that use a 6AX4 as V19 may use a 150Ω resistor in this application.
• Items R86A, R86B, R86C, C87A, C87B, C87C are combined in one unit.

TRANSFORMER (FILAMENT)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RAYTHEON PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	RCA TYPE No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC	6.3VAC ②1.43A	③5.7A	12D21180-1		P-2947 ① ④	F-18X ① ②			

① Drill one new mounting hole.
② Tape center tap on 6.3V winding.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	RAYTHEON PART No	Stancor PART No	Merit PART No	Triad PART No	RCA TYPE No	Halldorson PART No	Thordarson PART No.
T2	Vert. Osc. Trans.	12M-18241	A-8125	A-3003	A-97X	209T1 ①	B8702	TV-24A87 ①
T3	Horiz. Output Trans.	201-22396-1 201-22396 ②						
T4	Vert. Output Trans.	13C-20781-2	A-8141	A-3039	A-102X		Z1806	T-36854
T5A	Yoke-Horiz.(8.4MH)	201-22697 ④	DY-8A ③	MDF-70③	Y-12 ③		DY601 ③	
B	Yoke - Vert. (45MH)							

① Drill one new mounting hole.
② Alternate horizontal output trans.
③ Use original deflection coil network.
④ Includes C112, R93 and R94.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	RAYTHEON PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	NOTES
T6	2.16KΩ	3.1Ω	13C22508	A-3876	A-2938	S-2X	Z1001	TS-24S50	

SPEAKER

ITEM No.	RATINGS SIZE	FIELD	V C IMP.	RAYTHEON PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	5"	PM	3.1Ω	18A21216	8T-105 Mod P5-X	5A07	

COILS (RF-IF)

ITEM No.	USE	DC RES PRI.	DC RES SEC.	RAYTHEON PART No	MEISSNER PART No	MERIT PART No	MILLER PART No.	NOTES
L1	UHF Ant. Coil	0Ω						
L2	UHF Ant. Coil	0Ω						
L3	UHF Ant. Coupling Loop	0Ω CT		62D-22401				
L4	UHF RF Coupling Loop	0Ω (Tapped)		62D-22254				
L5	UHF Mixer Coupling Loop	0Ω		62D-22360				
L6	Fil. Choke	0Ω		16A-22411				
L7	Cathode Choke	0Ω		16A-22411				
L8	RF Choke	1.1Ω		16A-22362				
L9	UHF IF Output Coil	0Ω CT		13B-22410				
L10	IF Trap	0Ω		13M-22425				Wound on 62MMF Cap.
L11	VHF Ant. Trans.	.7Ω	.7Ω	13M-23482				
L12	VHF Ant. Trans.	.7Ω	.7Ω	13M-22482				Wound on 62MMF Cap.
L13	IF Trap	0Ω		13M-22425				Wound on 62MMF Cap.
L14	IF Trap	0Ω		13M-22702				
L15	RF Choke	.1Ω		201-20405				
L16	VHF Ant. Coil	0Ω		13M-22328				Low Band, Core part #51A-22407
L17	VHF Ant. Coil	0Ω		13E-17140				High band, core part #61A-22409
L18	Fil. Choke	.1Ω		201-20405				
L19	Fil. Choke	.2Ω		16A-17937	19-3001	TV-189	6175	3 Microhenries
L20	Neutr.Coil	0Ω		13M-23044				
L21	RF Choke	.6Ω		16A-17128				
L22	RF Coil	0Ω		13M-22325				Low band, core part #51A-22407
L23	RF Coil	0Ω		13E-17140				High band, core part #61A-22409
L24	Mixer Grid Coil	0Ω		13M-22327				Low band, core part #51A-22405
L25	Mixer Grid Coil	0Ω		13E-17140				High Band, core part #51A-22409
L26	Fil. Choke	.1Ω		16A-20777				
L27	Osc.Coil	0Ω		13M-22703				Low Band, Core part #51A-22406
L28	Osc.Coil	0Ω		13E-17140				High Band, core part #61A-22404
L29	RF Choke	0Ω		13M-23738				
L30	Conv.Plate	.3Ω	.3Ω	13B-22424				
L31	RF Choke	2.4Ω		201-15606	19-3036	TV-180	4626	30 Microhenries
L32	RF Choke	2.2Ω		201-15608	19-3036	TV-180	4626	30 Microhenries
L33	3rd.Video IF Grid	.2Ω	.2Ω	201-23456	17-4531 ¶		6232 §	Includes trap & 1KΩ resistor
L34	Fil. Choke	.3Ω		16A-17937	19-3001	TV-189	6175	3 Microhenries
L35	Int.Video IF Plate	.2Ω		201-22562	17-4504 ♦		6231 **	Includes 3.9MΩ resistor & 470MMF Cap.
L36	RF Choke	2.3Ω		201-15606	19-3036	TV-180	4626	30 Microhenries
L37	41.25MC Trap	0Ω		201-22565				Raytheon part number includes C48
L38	47.25MC Trap	0Ω		201-22566	20-1047			Raytheon part number includes C49
L39	2nd.Video IF	.3Ω		201-22570	17-4504 ▲		6234 °	
L40	Fil. Choke	.1Ω		16A-17937	19-3001	TV-189	6175	3 Microhenries
L41	Fil. Choke	.1Ω		16A-17937	19-3001	TV-189	6175	3 Microhenries
L42	RF Choke	2.2Ω		201-15608	19-3036	TV-180	4626	30 Microhenries
L43	3rd.Video IF	.1Ω		201-22426	17-4503 ■		6232 ▲	20 Microhenries Includes capacitors
L44	RF Choke	1.7Ω		201-15608	19-3036	TV-180	4626	30 Microhenries
L45	RF Choke	2.2Ω		201-15608	19-3036	TV-180	4626	30 Microhenries
L46	4th.Video IF	.1Ω		201-22435	17-4505 ▼		6232 ♦	20 Microhenries Includes trap & 7MMF Cap.
L47	RF Choke	2.2Ω		16A-23024	19-6022	TV-180	6152	20 Microhenries
L48	Fil. Choke	.2Ω		16A-17937	19-3001	TV-189	6175	3 Microhenries
L49	RF Choke	2.3Ω		201-15606	19-3036	TV-180	4626	30 Microhenries
L50	9th.Video IF	.5Ω	.5Ω	13B-22430				20 Microhenries Includes capacitors & Series Peak.Coil
L51	Series Peaking Coil	1.7Ω		16A-22427	19-1004		4610	7.5 Microhenries
L52	Shunt Peaking Coil	23Ω		16A-19365	19-3500		4648	410 Microhenries
L53	Series Peaking Coil	8.5Ω						276 Microhenries, Not used in all Models.
L54	Series Peaking Coil	5.5Ω		16A-20021	19-3125		4644	190 Microhenries
L55	Shunt Peaking Coil	10Ω		16A-19466			4648	380 Microhenries
L56	Shunt Peaking Coil	10Ω		16A-19466			4648	380 Microhenries
L57	Sound IF	1.6Ω		201-23561	17-3400	TV-151	4649	230 Microhenries Raytheon part number includes C71, C73 & R65

(CONT'D ON NEXT PAGE)

RAYTHEON MODELS UC-2139A, UC-2141A, UC-2142A, UC-2144A, UC-2145A, UM-2133A, UM-2134A, UM-2135A, UM-2136A

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	RAYTHEON PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L58	Ratio Det.	7Ω	1.5ΩCT	13M-22303	17-3497	TV-115	6205	Tertiary winding -.75Ω
L59	Horiz.Osc.	75Ω		201-22302	19-1575	TV-163 †	6210 †	Raytheon part number includes C100.
L60	4.5MC Trap	1Ω			20-1004	TV-151	1470	Not used in all Models.

‡ Detune trap, add 3.9KΩ resistor & 470MMF Capacitor externally, cut out chassis hole and drill mounting holes.
** Use on winding only, add 3.9KΩ resistor & 470MMF Capacitor externally, cut out chassis hole and use clip mounting.
▲ Use one winding only, detune trap, add 15MMF capacitor externally, cut out chassis hole and use clip mounting.
■ Detune trap, add 15MMF capacitor externally, cut out chassis hole and drill mounting holes.
♦ Use primary and trap windings only, add 7MMF capacitor externally, cut out chassis hole and use clip mounting.
* Add 7MMF capacitor externally, cut out chassis hole and drill mounting holes.
† Enlarge mounting hole.
▬ Detune trap, cut out chassis hole and drill mounting holes.
Use one winding only, cut out chassis hole and use clip mounting.
¶ Add 1KΩ resistor across primary winding, disconnect R34 , cut out chassis hole and drill mounting holes.
§ Add 1KΩ resistor across primary winding, cut out chassis hole and use clip mounting.

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	RAYTHEON PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
L61	.300A	70Ω	2.92HY	16A21214	C-2326		C-17X	C5037	

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT	RAYTHEON PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	
M1	.300ADC	21J20097		1023A	6S350	350	
M2	.300ADC	21J20097		1023A	6S350	350	

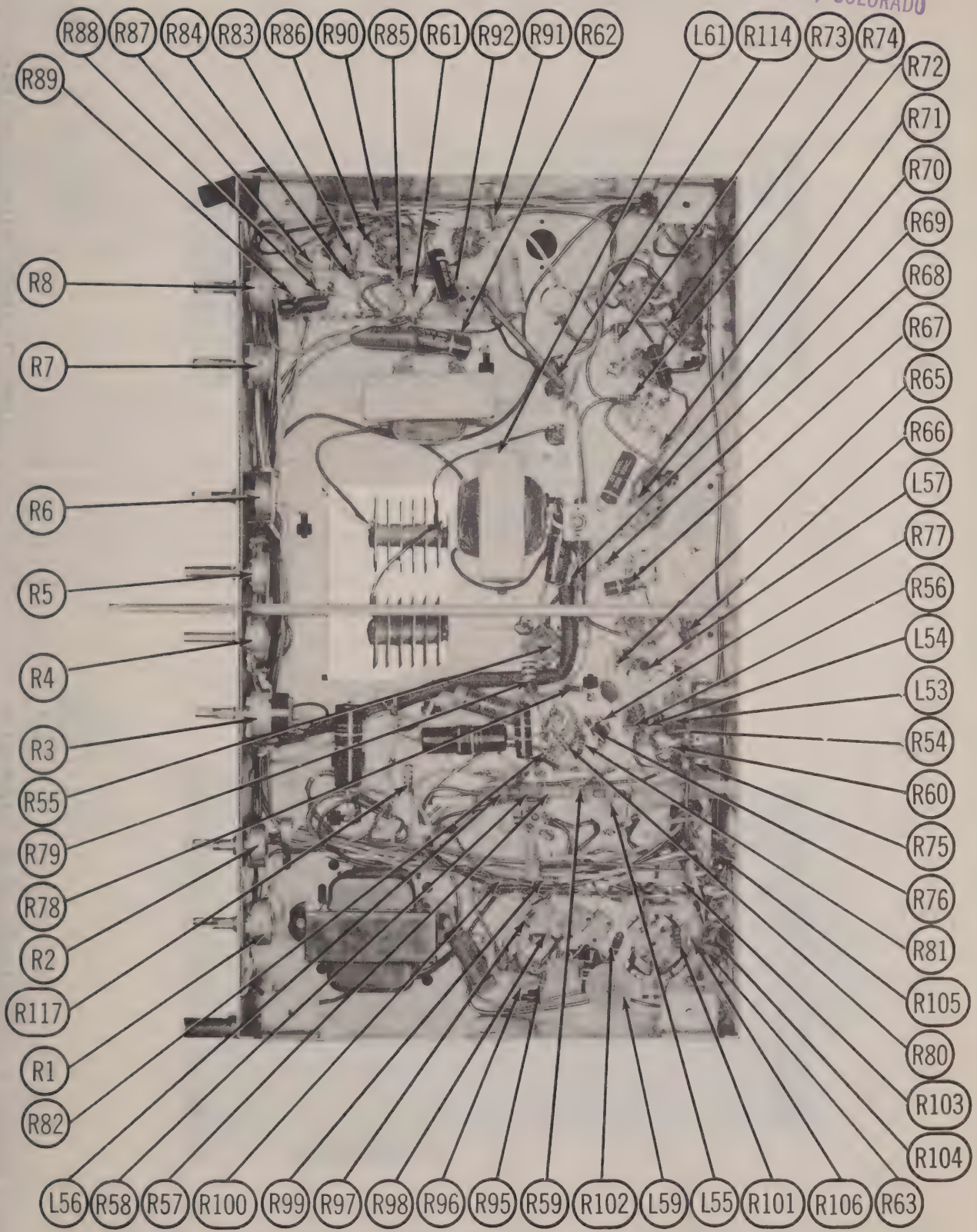
CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		RAYTHEON PART No.	SYLVANIA PART No.		
M3	1N82	8M-22649	1N82 or 1N82A		UHF mixer (clip-in)
M4	CK706	8M-21959	1N60		Video detector (pigtail)

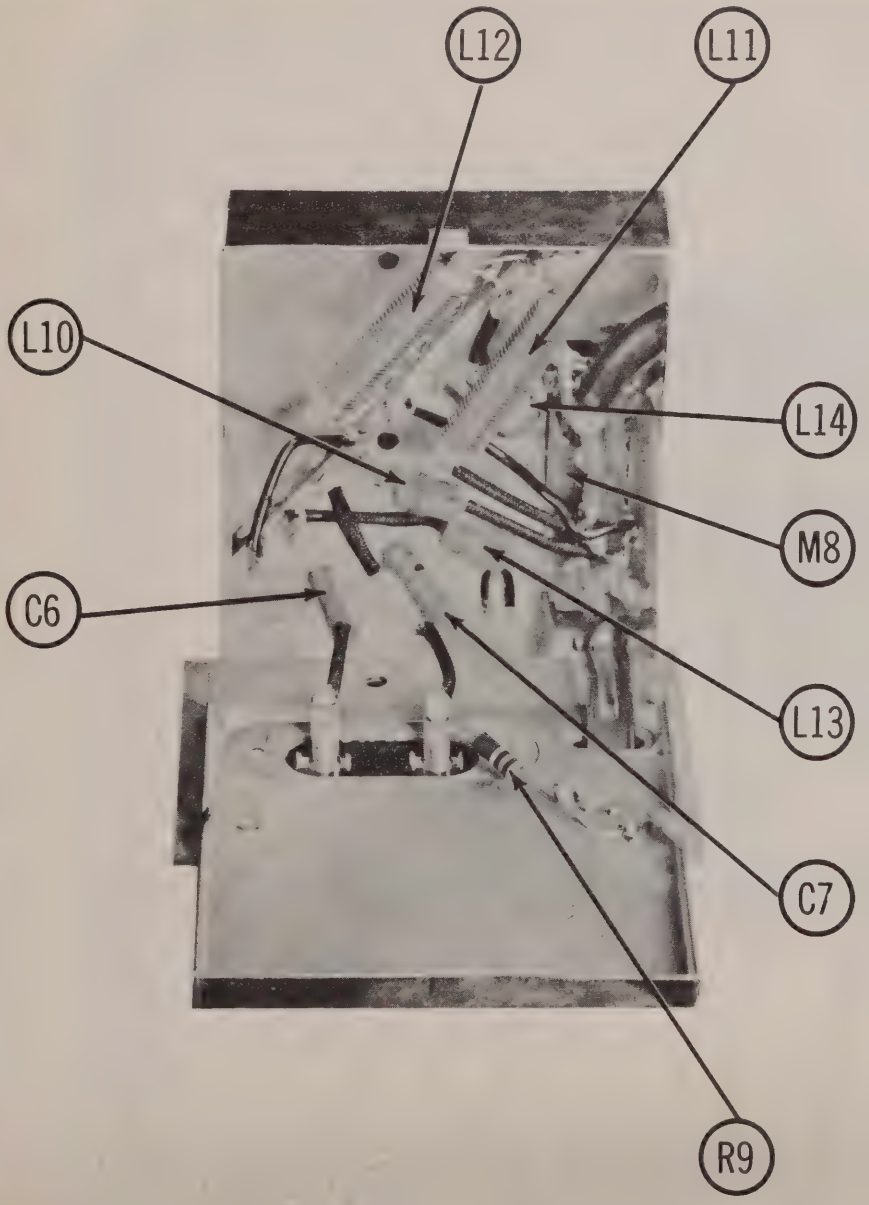
MISCELLANEOUS

ITEM No.	PART NAME	RAYTHEON PART No.	NOTES
M5	Dial light		# 47 bayonet (2 used)
M6	Tuner	C2A-22118	UHF
M7	Tuner	C2C-22190	VHF
M8	Switch	20B-22422	UHF-VHF changeover (ANT)
M9	Switch	20M-22462	UHF Osc.
M10	Centering magnet	16M-20697	
M11	Ion trap	16M-19906	
M12	Correction magnet	16M-22602	Horiz. Linearity
M13	Correction magnet	16M-22607	Anti-pin-cushion
M14	Switch	20M-22462	UHF Osc.
	Trimmer cap	8E-22419	1st Video IF coupling
	Trimmer cap	8E-18508	Sound discriminator
	Cabinet	24D-22818	Model UM-2134
	Cabinet	24D-22819	Model UM-2133
	Cabinet	24D-22907	Model UM-2135
	Cabinet	24D-22908	Model UM-2136
	Cabinet	24D-22892	Model UC-2139
	Cabinet	24D-22903	Model UC-2141
	Cabinet	24D-22901	Model UC-2142
	Cabinet	24D-22910	Model UC-2144
	Cabinet	24D-22911	Model UC-2145
	Safety glass	30M-21485	
	Knob	5B-22637	Tuning
	Knob	5B-22613	(2) picture & volume
	Knob	5B-20755-29	Star knob (4 used)
	Escutcheon assy.	200-22558	

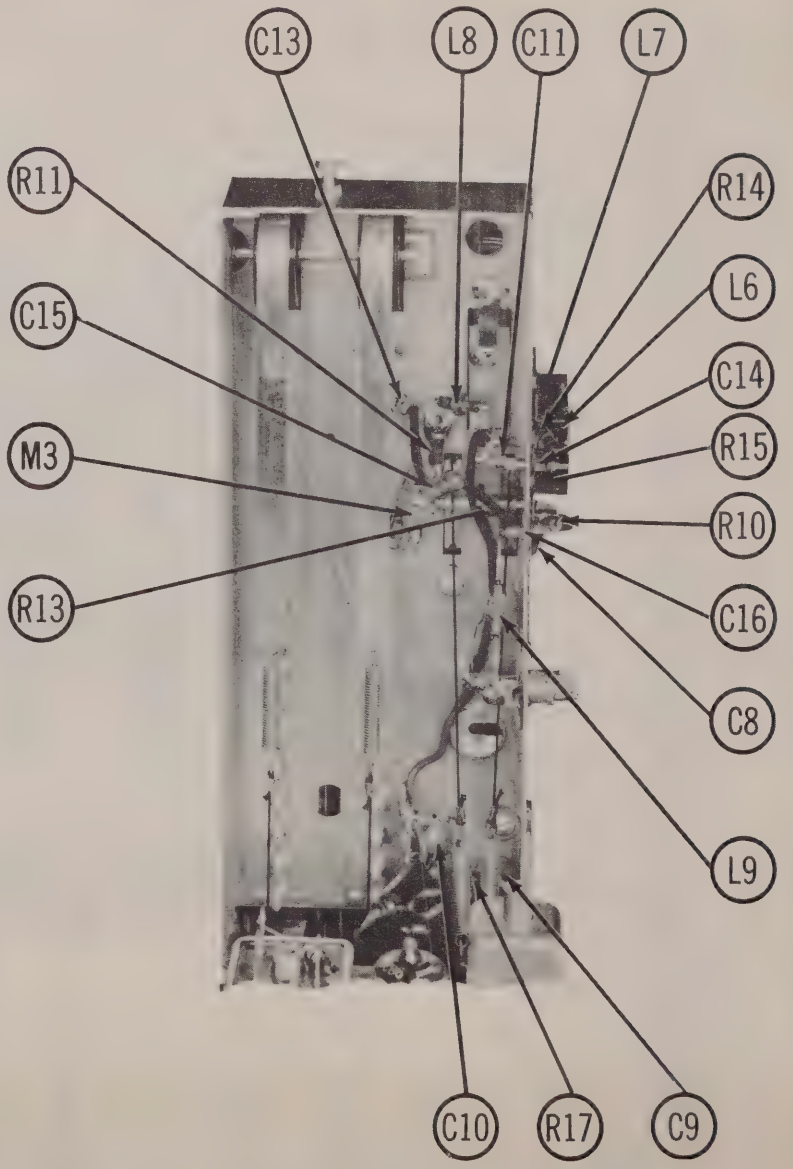
PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO



SWEEP CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION



ALTERNATE MATCHING SUB CHASSIS



UHF TUNER SUB ASSEMBLY

TROUBLE SHOOTING AIDS (cont)

PROPERTY OF
L. E. BLANKENSHIP
3870 MEADE ST.
DENVER, COLORADO

POWER

DEAD SET

If only V18, V19, V12 and V8 filaments light, check T1. If no filaments light, check AC interlock assembly and switch on volume control. If all filaments light, check R115, M1, M2 and other associated B+ filter components.

SMALL AND/OR DIM PICTURE

Check M1 and M2. Check C1, C2, C3A, and other B+ filter network components.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V17, V18, V19 and V20. Check waveform W14.

If Satisfactory	If Unsatisfactory
Check R113, T5A, T3 and other associated components.	Check C106, C107, R107, R109 and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V17, V18, V19 and V20. Measure B+.

If Satisfactory	If Unsatisfactory
Follow procedure outlined under "Loss of High Voltage".	Follow procedure outlined under "Small and/or Dim Picture".

BLOOMING

Check by substitution V20, V19 and V18. Check R113, T3, T5A, C1, C2, C3A, M1, M2, C5, R112, picture tube and other associated components.

GENERAL

RASTER SOUND NO PICTURE

Follow procedure outlined under "Loss of Video".

RASTER PICTURE NO SOUND

Follow procedure outlined under "Weak or No Sound".

RASTER NO PICTURE NO SOUND

Check by substitution V2, V3, V4, V5, V6, V7 and V8. Check video detector assembly. Check components associated with the video IF and RF tuner.

NO RASTER NO SOUND

Follow procedure outlined under "Dead Set".

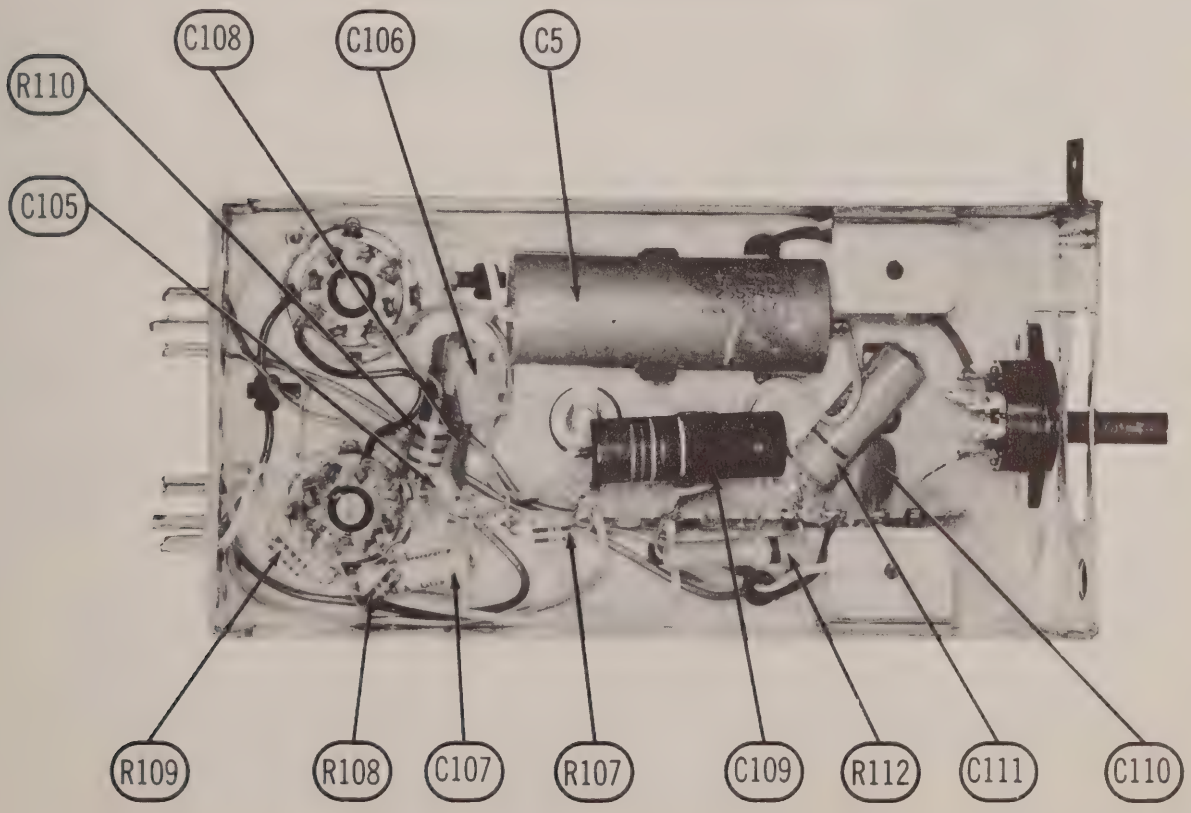
KEYSTONE EFFECT

Check T5, R93, R94 and C112.

INTERMITTENT STREAKS

Check video signal for interference pulses. Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.



POWER SUPPLY CHASSIS-BOTTOM VIEW

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

For touch-up adjustments of RF tuner oscillator adjustments, it is necessary to remove the chassis from the cabinet. (See Disassembly instructions).

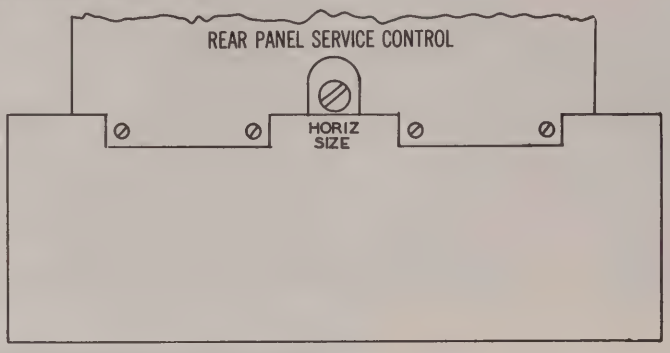
PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass remove three (3) wood screws holding metal strip at the bottom of safety glass. Remove metal strip and safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION



HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal oscillator, it is necessary to remove the rear cover and supply power to set. Adjustment is located on top of chassis. Set the horizontal hold control at the center of its range and adjust the horizontal oscillator slug (L59) until picture synchronizes horizontally. (For location see tube placement chart).

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (L58) located on top of chassis. (See tube placement chart).

FUSES

One fuseable resistor is used for LV power supply protection. (For location, see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting a magnetic ring around the neck of the picture tube located flush against the yoke. Turn the disc-like knob and at the same time rotate the ring around the tube until picture is properly centered.

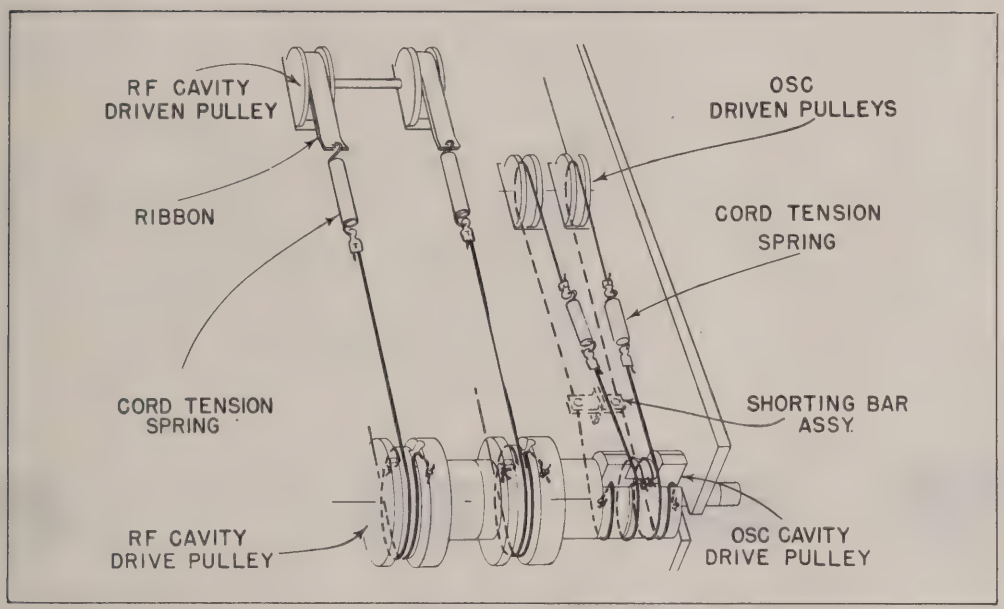
ANTI-PIN CUSHION ADJUSTMENT

Reduce the picture size so that the sides of the raster are visible, and position the magnets so that all sides are straight lines and the corners are at right angles.

DISASSEMBLY INSTRUCTIONS

1. Remove 1 push on type control knob and 1 metal balance control knob from front panel.
2. Remove 4 metal screws from front dial assembly. Remove front dial assembly.
3. Remove 6 push on type control knobs from front of chassis.
4. Disconnect built-in antennas (VHF & UHF).
5. Remove 6 wood and 1 metal screws. Remove rear cover.
6. Disconnect speaker plug, yoke plug, CRT socket and HV plug.
7. Remove 8 chassis bolts. Remove chassis.
8. Remove 2 speaker nuts. Remove speaker.

OF
SHIP
COLORADO



UHF DRIVE CORD STRINGING

PHOTOFACT* Folder

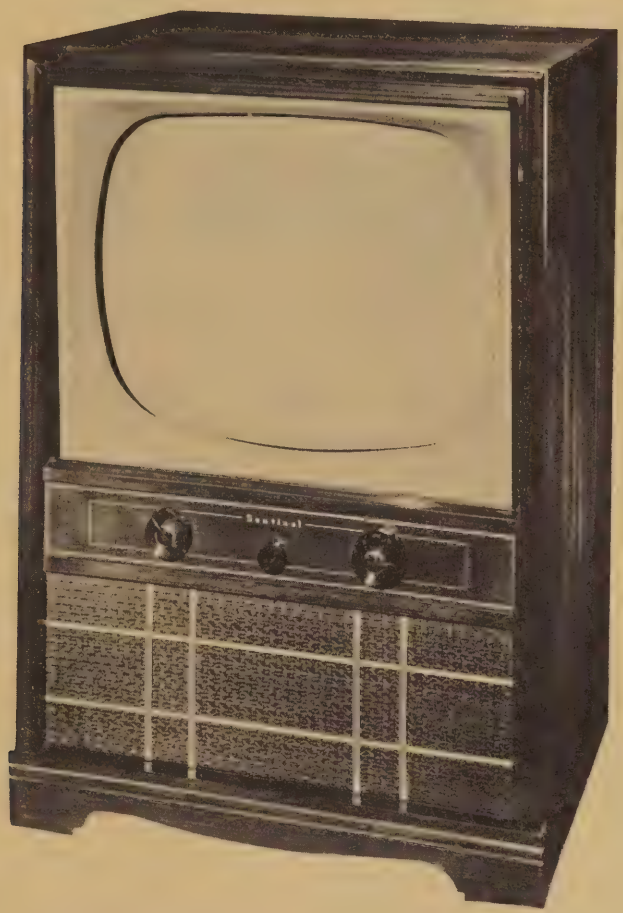
SENTINEL MODELS 1U-532, A, 1U-542, A, 1U-552, 1U-554, 1U-562, 1U-564

IMPORTANT FILING NOTICE

The contents for this envelope will be found among the last folders in this complete set of folders . . . *unless* it has been purchased as part of a *complete* volume of PHOTOFACTS assembled in a DeLuxe Binder.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO



MODEL 1U-542A

SENTINEL MODELS 1U-532, A, 1U-542, A, 1U-552, 1U-554, 1U-562, 1U-564

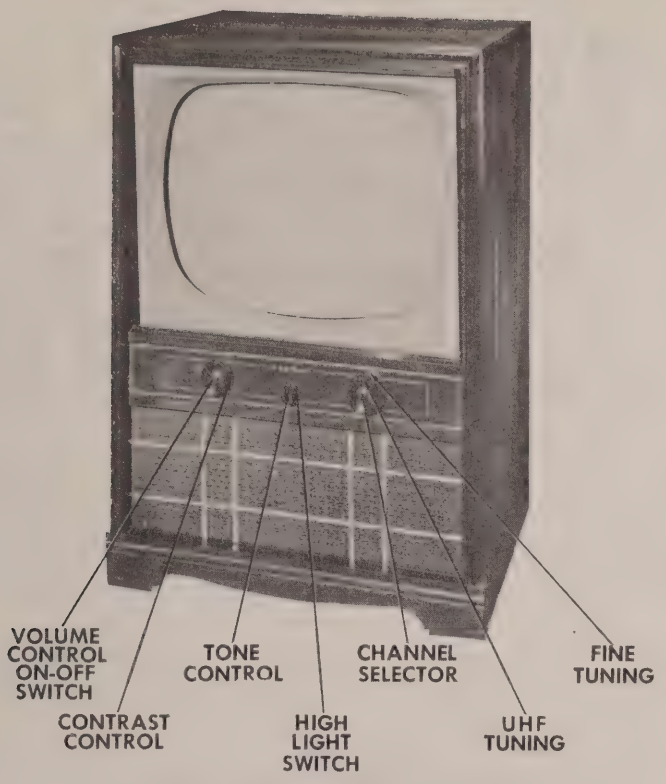
HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1954 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

DATE 5-54 SET 239 FOLDER 8

SENTINEL MODELS 1U-532, A, 1U-542, A, 1U-552, 1U-554, 1U-562, 1U-564

PROPERTY OF
L. F. BLANKENSHIP
[illegible] MEADE ST.
DENVER, COLORADO



SENTINEL MODEL 1U-542A

TRADE NAME	Sentinel Models 1U-532, A, 1U-542, A, 1U-552, 1U-554, 1U-562, 1U-564
MANUFACTURER	Sentinel Radio Corp., 2100 W. Demster, Evanston, Ill.
TYPE SET	Television Receiver
TUBES	Twenty-two
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING 2.19 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

INDEX

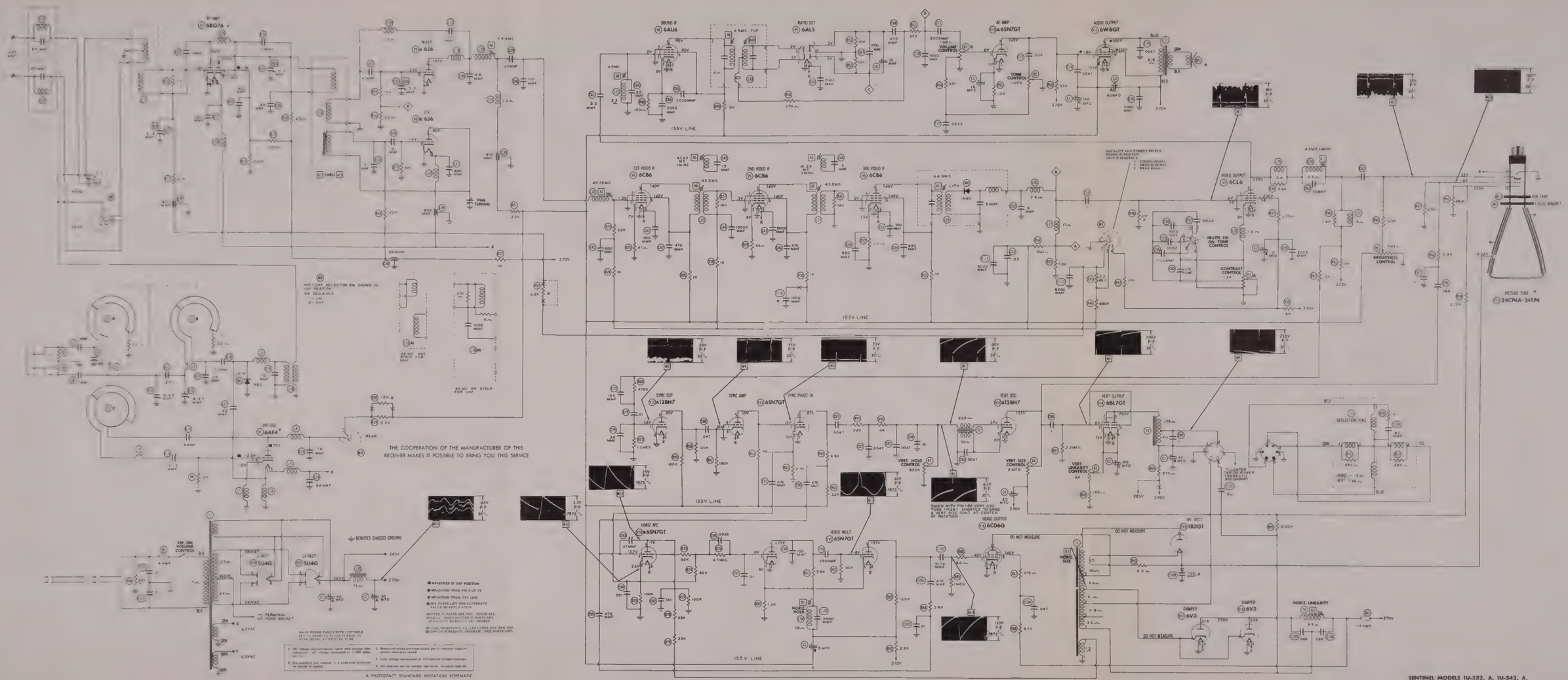
Alignment Instructions 6, 7
Drive Cord Stringing 18
Disassembly Instructions 18
Horizontal Sweep Circuit Adjustments 11
Parts List and Descriptions ..... 13 thru 16
Photographs
Cabinet-Rear View 11
Capacitor Identification 4, 9
Chassis-Top View 3
RF Tuner 10, 11, 16
Resistor Identification 19, 20
Photographs (Cont)
Trans., Inductor & Alignment Identification 17
Resistance Measurements 8
Servicing in the Field 18
Schematic (Alternate tuner) 3
Schematic (TV) 2
Trouble Shooting Aids 12, 17
Tube Failure Check Chart 5
Tube Placement Chart (Bottom View) 8
Tube Placement Chart (Top View) 5

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1954 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

DATE 5-54 SET 239 FOLDER 8

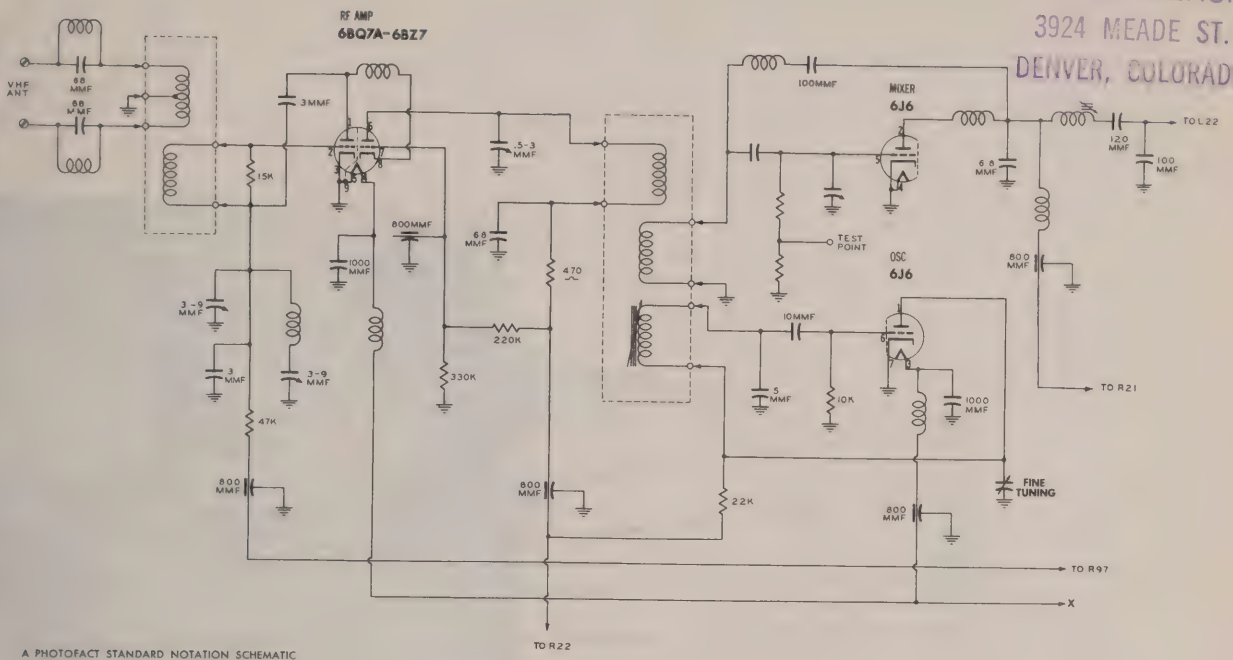
SENTINEL MODELS 1U-532, A, 1U-542, A, 1U-552, 1U-554, 1U-562, 1U-564


THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
155V LINE
DO NOT MEASURE
PICTURE TUBE
24CNA-24TM
DENOTES CHASSIS GROUND
TO TERMINAL OF FUSE SOCKET
40 MC RF STRIP FOR UHF
4 PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1954

SENTINEL MODELS 1U-532, A, 1U-542, A, 1U-552, 1U-554, 1U-562, 1U-564

SENTINEL MODELS 1U-532, A, 1U-542, A, 1U-552, 1U-554, 1U-562, 1U-564

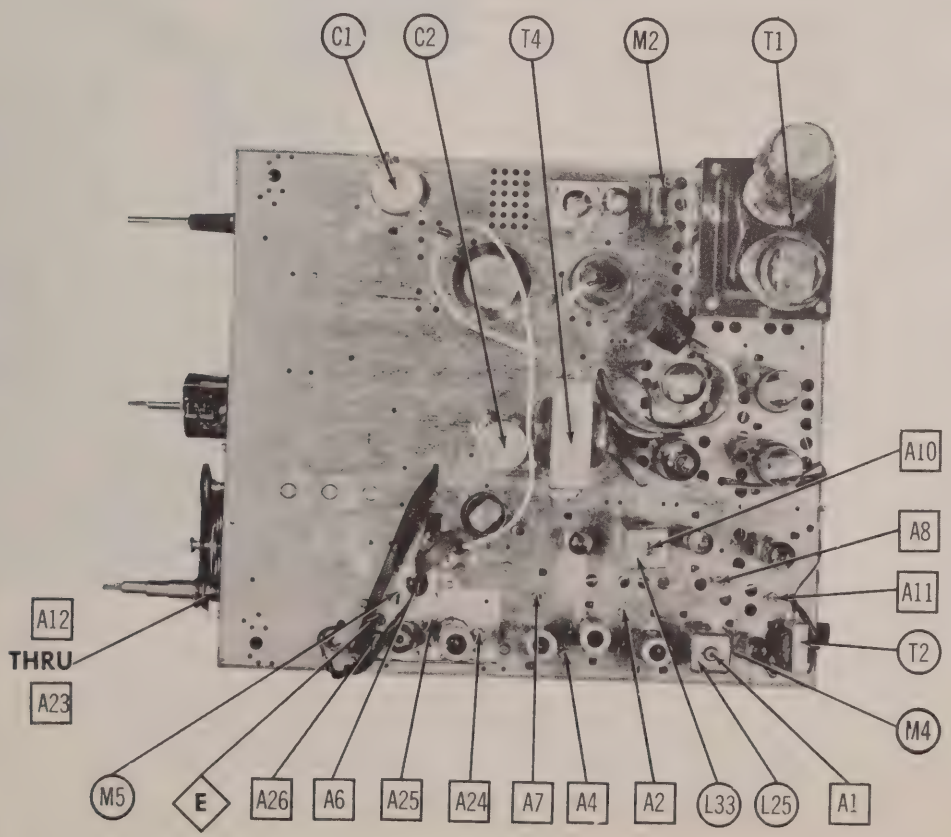
PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO



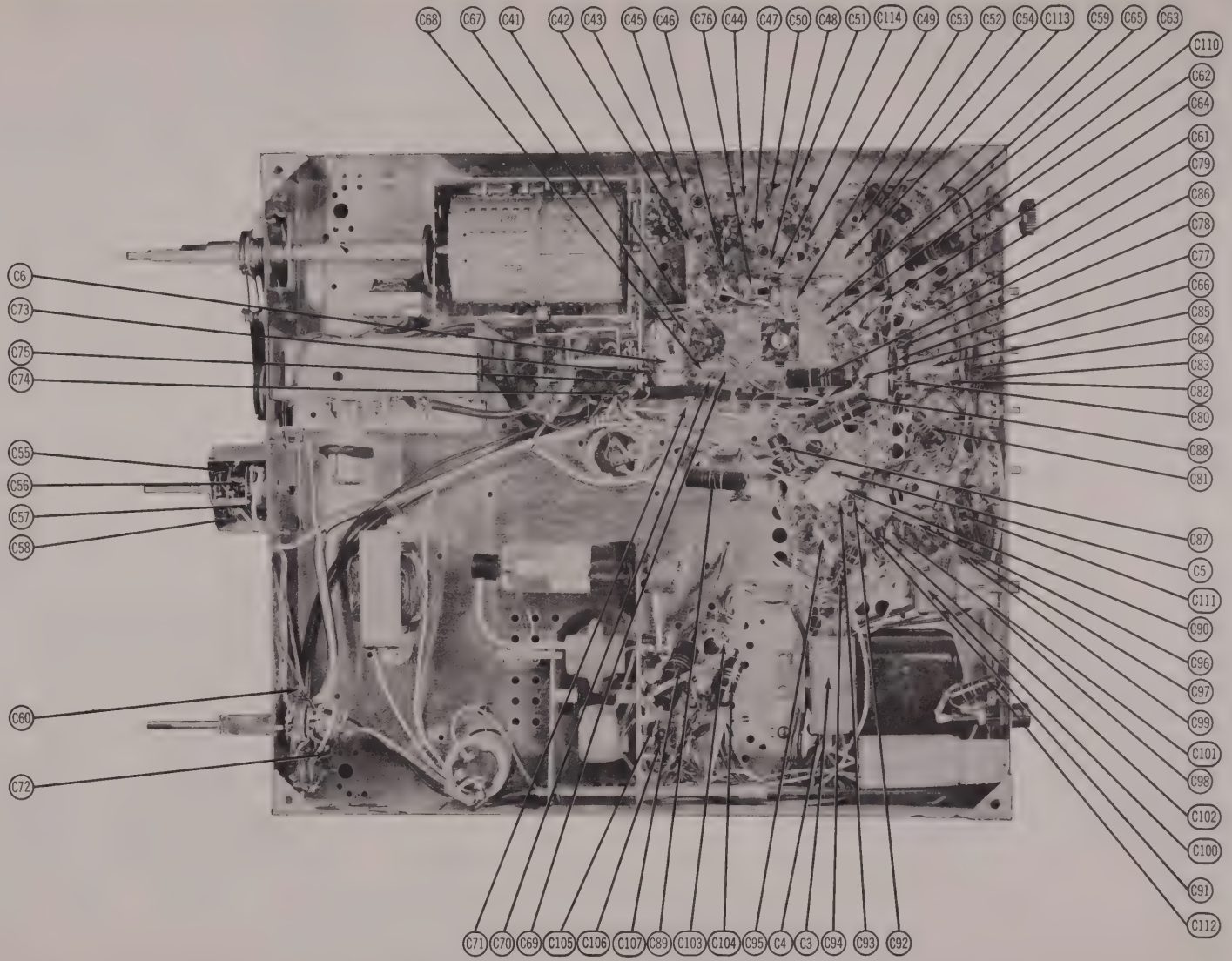
A PHOTOFACT STANDARD NOTATION SCHEMATIC
©Howard W. Sams & Co., Inc. 1954

ALTERNATE VHF TUNER PART NO. 20E856 USED ON MODELS 532, 552 & 554

ALTERNATE TUNER SCHEMATIC



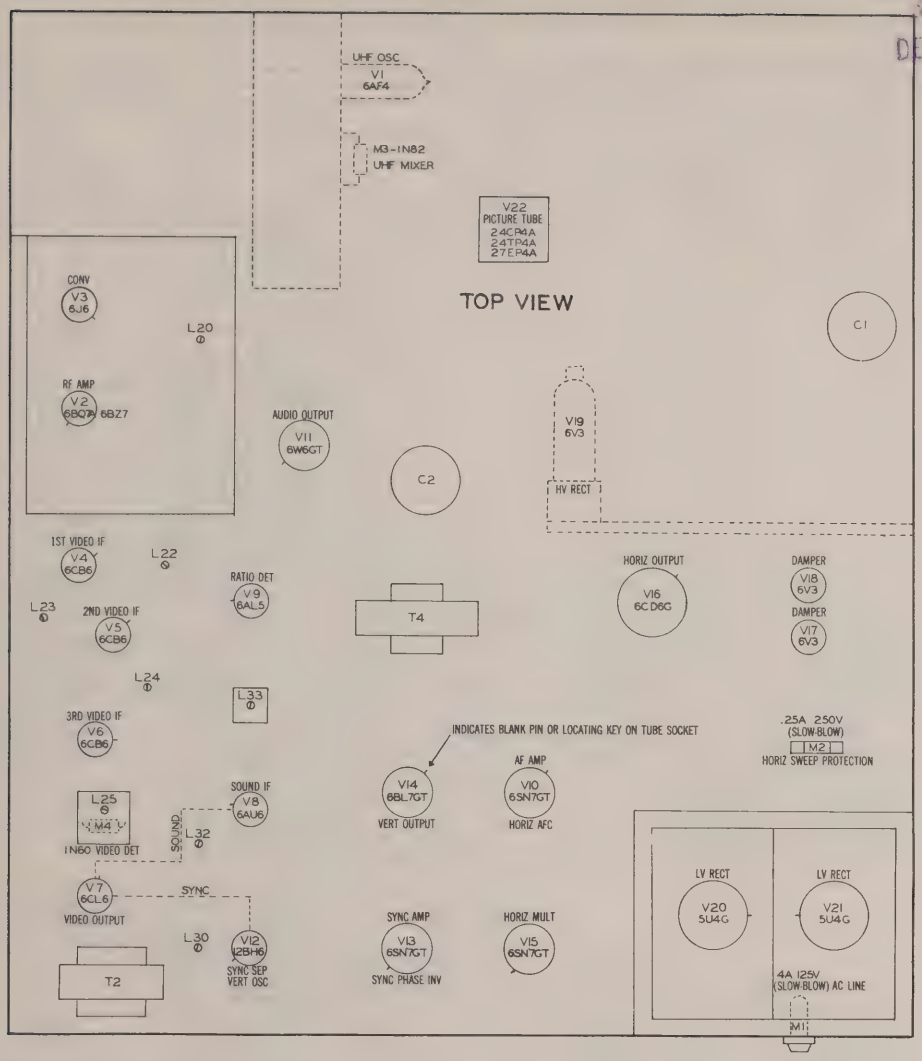
CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V20, V21, Fuse (M1)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V3, V4, V5, V6, V7, V11 (V1 UHF only)
No pic, no sound, has snow - V2, V3, V4
No pic, has sound, has raster - V7, V22
Has pic, no sound - V8, V9, V10, V11

SYNC FAILURE
No vert. sync - V12, V13
No horiz. sync - V10, V13, V15
No vert. or horiz. sync - V12, V13

SWEEP FAILURE
No raster, has sound - V15, V16, V17, V18, V19, V22, Fuse (M2)
No vertical deflection - V12, V14
Poor vert. linearity or foldover - V12, V14
Poor horiz. linearity or foldover - V15, V16, V17, V18
Narrow picture - V15, V16, V17, V18, V19, V20, V21
Vert. off freq. - V12, V13
Horiz. off freq. - V10, V13, V15

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube (V15) to disable the high voltage.
Allow 1/2 hour warm-up period for receiver and test equipment.

VIDEO IF ALIGNMENT

Remove the converter tube (V3) and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect the negative lead of a 3 volt battery to the ungrounded side of C53. Connect the positive lead to chassis.
Set the "Locality Adjuster" switch (rear panel) to "Strong Signal" position.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	44.0MC (Unmod)	Any	DC probe thru 47KΩ to point ◇A◇. Common to chassis.	A1	Adjust for maximum deflection. Attenuate signal generator to maintain not more than 2 volts at VTVM.
2.	"	"	43.0MC	"	"	A2	"
3.	"	"	41.25MC	"	"	A3	Adjust for MINIMUM deflection. Repeat steps 2 and 3.
4.	"	"	45.4MC	"	"	A4	Adjust for maximum deflection. Attenaute signal generator to maintain not more than 2 volts at VTVM.
5.	"	"	47.25MC	"	"	A5	Adjust for MINIMUM deflection. Repeat steps 4 and 5.
6.	"	"	44.6MC	"	"	A6	Detune A7 by turning slug out of coil as far as possible. Adjust A6 for maximum deflection.
7.	"	"	45.75MC	"	"	A7	Adjust for maximum deflection. Attenuate signal generator to maintain not more than 2 volts at VTVM.

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	44MC (10MC Swp)	41.25MC 42.25MC 45.75MC 47.25MC	Any	Vert. Amp. thru 47KΩ to point ◇A◇. Low side to chassis.		Check for response similar to Fig. 1. If necessary, retouch A1, A2, A4, A6 and A7 to obtain desired response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Remove third video IF amplifier (V6) from its socket. Set contrast control to maximum contrast position.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	.001MFD	High side to point ◇B◇. Low side to chassis.	4.5MC (Unmod.)	Any	DC probe thru 47KΩ to point ◇C◇. Common to chassis.	A8, A9	Adjust for maximum deflection.
10.	"	"	"	"	DC probe thru 47KΩ to point ◇D◇. Common to chassis.	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Replace V6 in its socket.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Remove third video IF amplifier (V6) from its socket. Set contrast control to maximum contrast position.
Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	.001MFD	High side to point ◇B◇. Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. thru 47KΩ to point ◇C◇. Low side to chassis.	A8, A9	Disconnect stabilizing capacitor C6. Adjust for curve of maximum amplitude and symmetry similar to Fig. 2.
10.	"	"	"	"	"	Vert. Amp. thru 47KΩ to point ◇D◇. Low side to chassis.	A10	Reconnect stabilizing capacitor C6. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 3. SLIGHTLY retouch A9 for maximum amplitude and straightness of crossover lines. Replace V6 in its socket.

4.5MC TRAP ALIGNMENT

Remove V6 from its socket.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
11.	.001MFD	High side to pin 11 of picture tube. Low side to chassis.	4.5MC (Unmod)	Any	DC probe thru 47KΩ to point ◇C◇. Common to chassis.	A11	Adjust for MINIMUM deflection. Replace V6 in its socket.

ALTERNATE 4.5MC TRAP ALIGNMENT

Tune in the strongest TV station available and adjust A-11 for minimum 4.5MC beat in picture.

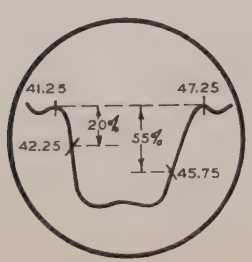


FIG.1

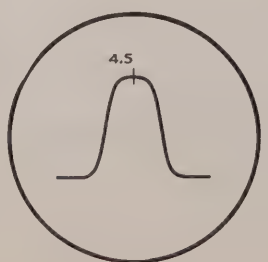


FIG.2

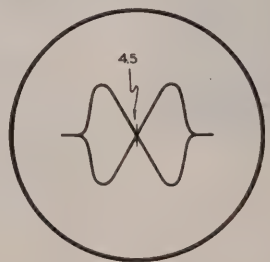


FIG. 3

ALIGNMENT INSTRUCTIONS (cont)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
The channel oscillator adjustment screws are reached thru a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible thru this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 47KΩ to point (A). Low side to chassis.	A12	Adjust to place sound marker in trap notch as in Fig. 4. Video marker should be at 55%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A13	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A14	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A15	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A16	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A17	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A18	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A19	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A20	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A21	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A22	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A23	

RF AND MIXER ALIGNMENT

Leave bias connected as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	207MC (20MC Swp)	205.25MC 209.75MC	12	Vert. Amp. thru 10KΩ to point (E). Low side to chassis.	A24, A25 A26	Adjust for response similar to Fig. 5.
14.	"	"	213MC (20MC Swp)	211.25MC 215.75MC	13	"		Check for response similar to Fig. 5. If markers fall below 70% on any channel make compromise adjustment of A24, A25 and A26 with channel switch set to that channel, then recheck all other channels to see that they have not been seriously affected.
			201MC (20MC Swp)	199.25MC 203.75MC	11			
			195MC (20MC Swp)	193.25MC 197.75MC	10			
			189MC (20MC Swp)	187.25MC 191.75MC	9			
			183MC (20MC Swp)	181.25MC 185.75MC	8			
			177MC (20MC Swp)	175.25MC 179.75MC	7			
			85MC (20MC Swp)	83.25MC 87.75MC	6			
			79MC (20MC Swp)	77.25MC 81.75MC	5			
			69MC (20MC Swp)	67.25MC 71.75MC	4			
			63MC (20MC Swp)	61.25MC 65.75MC	3			
			57MC (20MC Swp)	55.25MC 59.75MC	2			

UHF TUNER ALIGNMENT

The UHF tuner portion of this receiver has been properly aligned at the factory and is very stable. Alignment of this portion of the receiver should not be required in the field.

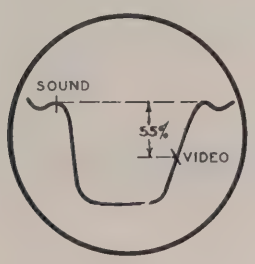


FIG.4

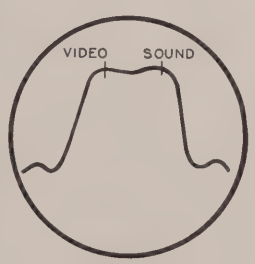


FIG.5

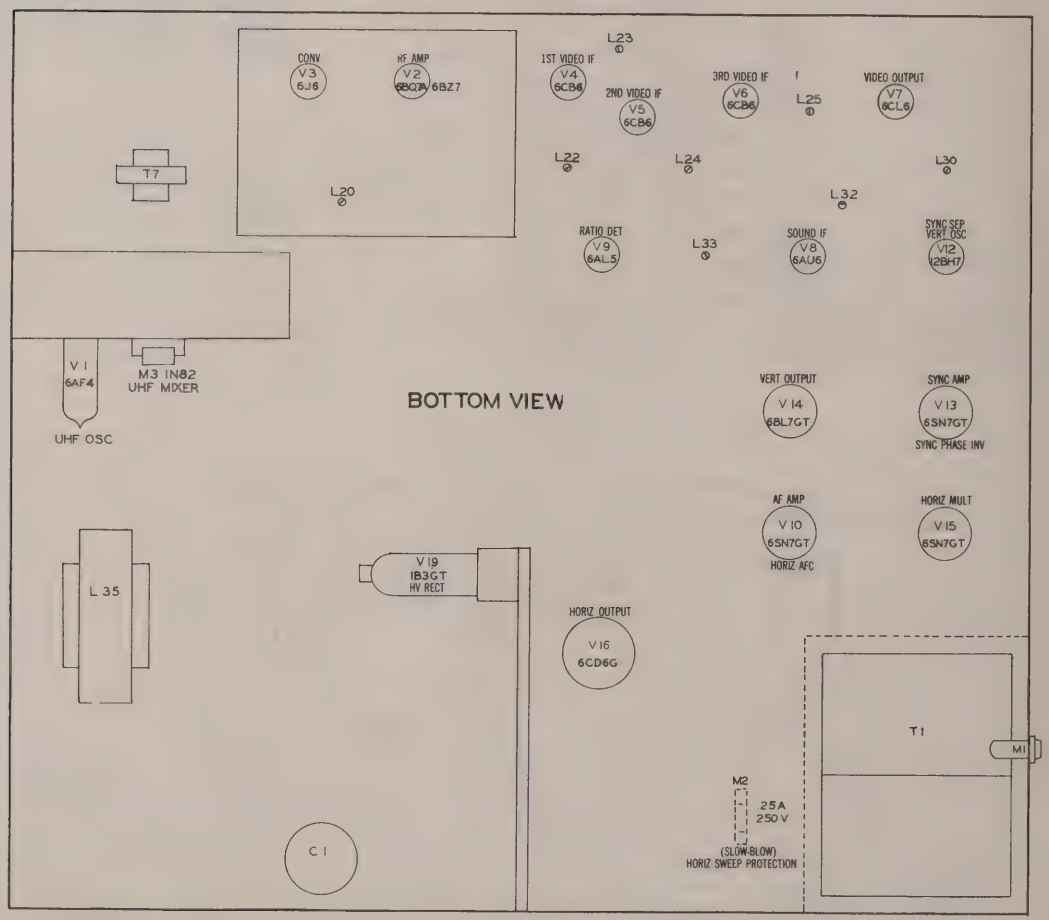
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AF4	■♦ 2. 7KΩ	12KΩ	0Ω	. 1Ω	0Ω	12KΩ	■♦2. 7KΩ		
V 2	6BQ7A	INF	4. 4Meg	0Ω	. 1Ω	0Ω	† 1. 5KΩ	† 220KΩ	INF	0Ω
V 3	6J6	† 23KΩ	♦ 2. 2KΩ	. 1Ω	0Ω	235KΩ	10KΩ	0Ω		
V 4	6CB6	1. 5Meg	47Ω	0Ω	. 1Ω	♦ 1KΩ	♦ 1KΩ	0Ω		
V 5	6CB6	1. 5Meg	56Ω	0Ω	. 1Ω	♦ 1KΩ	♦1KΩ	0Ω		
V 6	6CB6	. 1Ω	120Ω	0Ω	. 1Ω	♦ 1KΩ	♦ 1KΩ	0Ω		
V 7	6CL6	600Ω	470KΩ	† 18KΩ	. 1Ω	0Ω	† 4. 1KΩ	0Ω	† 18KΩ	470KΩ
V 8	6AU6	3. 3Ω	150Ω	. 1Ω	0Ω	♦ 10KΩ	♦ 10KΩ	150Ω		
V 9	6AL5	INF	INF	. 1Ω	0Ω	10KΩ	0Ω	10KΩ		
V 10	6SN7GT	1 Meg	† 33KΩ	1. 2KΩ	265KΩ	40KΩ	100KΩ	0Ω	. 1Ω	
V 11	6W6GT	1 Meg	. 1Ω	† 300Ω	† 75Ω	† 33KΩ	INF	0Ω	100KΩ	
V 12	12BH7	▲ 2. 7Meg	600KΩ	50Ω	0Ω	0Ω	♦ 60KΩ	1. 2 Meg	0Ω	. 1Ω
V 13	6SN7GT	♦ 1 Meg	♦ 10KΩ	2. 2KΩ	0Ω	♦ 1 Meg	180KΩ	0Ω	. 1Ω	
V 14	6BL7GT	2. 2Meg	† 600Ω	500Ω	2. 2Meg	† 600Ω	500Ω	0Ω	. 1Ω	
V 15	6SN7GT	4. 9Meg	† 8KΩ	1. 2KΩ	100KΩ	† 120KΩ	1. 2KΩ	0Ω	. 1Ω	
V 16	6CD6G	▲ 22Ω	. 1Ω	0Ω	1 Meg	1 Meg	† 120KΩ	0Ω	† 9. 3KΩ	TOP CAP ▲ 6. 5Ω
V 17	6V3	INF	† 83Ω	INF	. 1Ω	0Ω	INF	†83Ω	INF	†83Ω
V 18	6V3	INF	† 83Ω	INF	. 1Ω	0Ω	INF	†83Ω	INF	†83Ω
V 19	1B3GT	PINS 1-8 HAVE INF. RESISTANCE								TOP CAP ▲ 186Ω
V 20	5U4G	INF	45KΩ	INF	23Ω	INF	24Ω	INF	45KΩ	
V 21	5U4G	INF	45KΩ	INF	23Ω	INF	24Ω	INF	45KΩ	
V 22	24CP4A	0Ω	4. 7KΩ	PIN 10 ▲ 440KΩ	PIN 11 ♦ 350KΩ	PIN 12 . 1Ω				

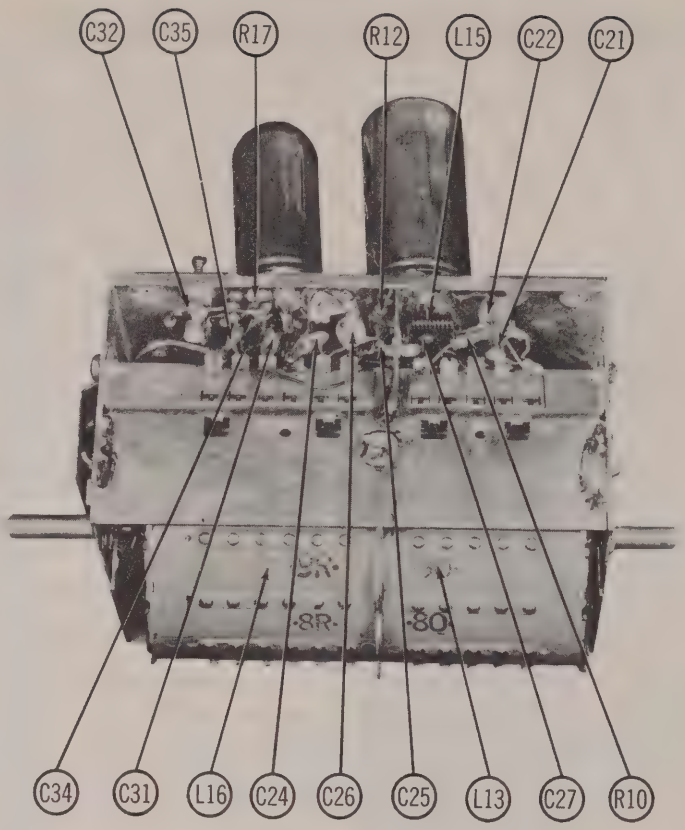
TOP CAP 700KΩ

TOP CAP 700KΩ

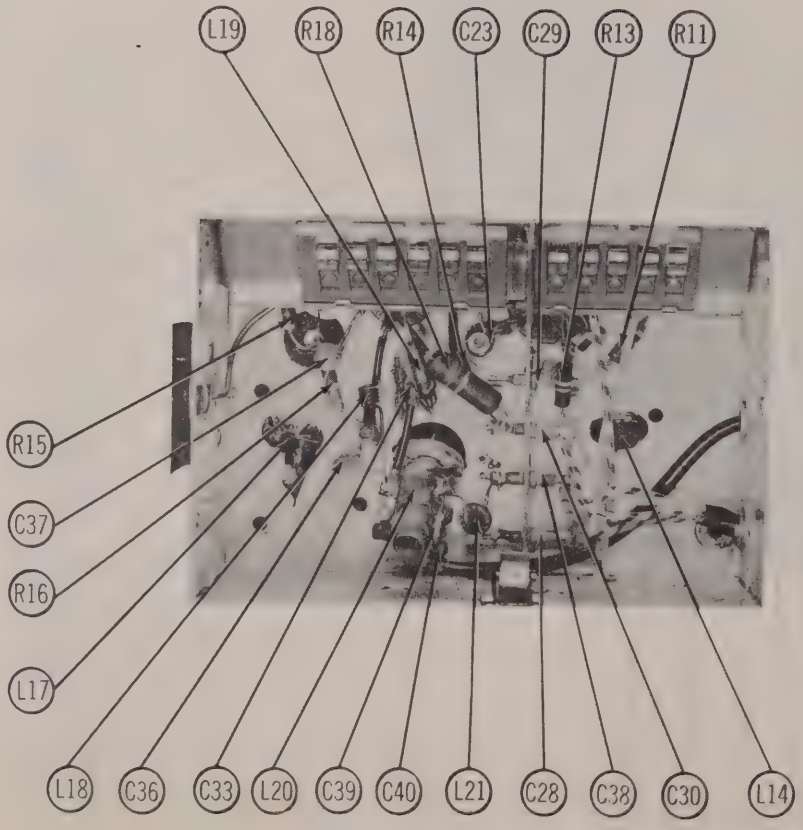
■ MEASURED IN UHF POSITION.
♦ MEASURED FROM 155 V. LINE.
† MEASURED FROM PIN 4 OF V11.
▲ MEASURED FROM TOP CAP OF V18, 19.



TUBE PLACEMENT CHART

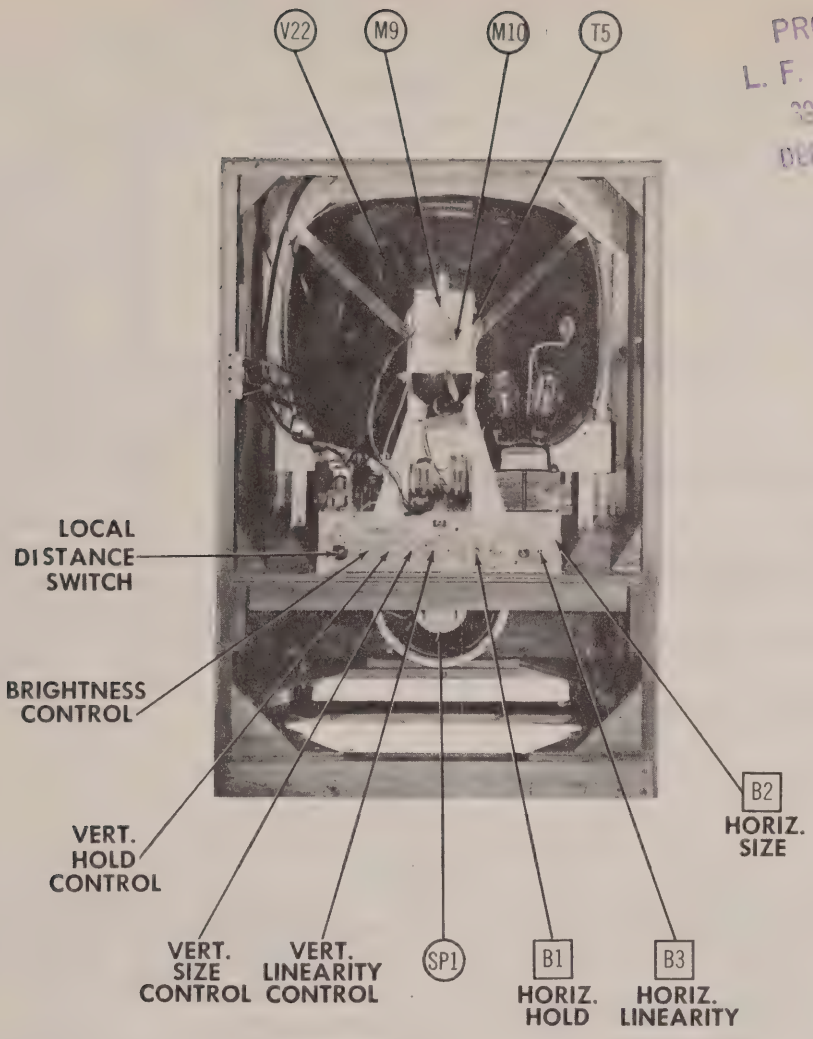


VHF TUNER-RIGHT SIDE



VHF TUNER-BOTTOM VIEW

PROPERTY OF
L. F. BLANKENSHIP
3824 MEADE ST
DENVER, COLORADO



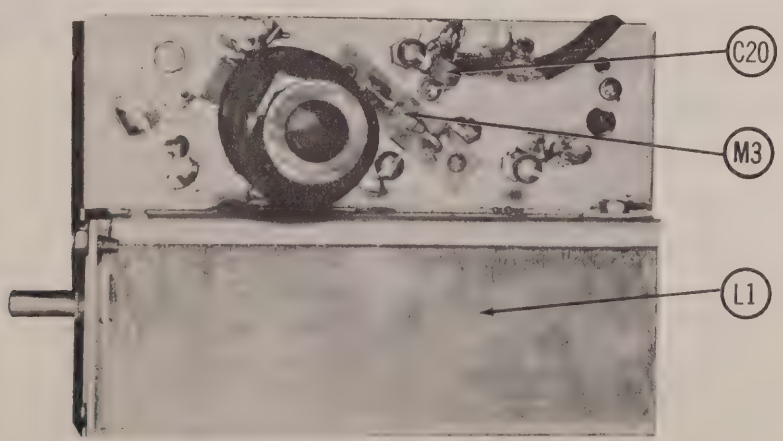
CABINET—REAR VIEW
HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Adjust the horizontal oscillator slug (B1) until the picture synchronizes horizontally.

Set the horizontal size adjustment (B2) for a picture that is slightly wider than necessary to fill the picture mask horizontally.

Adjust the linearity slug (B3) for a picture that is symmetrical from left to right.



UHF TUNER TOP VIEW

SET 239 FOLDER 8

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V15, V16, V17, V18, V20 and V21. Check adjustments B2 and B3. Check waveform W14.

If Satisfactory	If Unsatisfactory
Check T3, T5A, C104, C105, C106, R88, C107 and other associated components.	Check R85, C103 and other associated components.

DRIVE LINES

Check by substitution V15, V16, V17 and V18. Check C101, C103, C105, C106, T3, T5A, R85 and other associated components for failure or change of value.

COMPRESSED LEFT SIDE

Check by substitution V16, V17 and V18. Check components associated with the horizontal output and damper stages especially T3 and T5A.

FOLDS

Follow procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Check by substitution V15, V16, V17 and V18. Check C97 for open. Check T3, T5A, T6 and other associated components.

XMAS TREE EFFECT

Substitute V15. Check L34, C98, C99 and other associated components for failure or change of value.

VERTICAL

LOSS OF SWEEP

Check by substitution V12 and V14. Check waveform W8.

If Satisfactory	If Unsatisfactory
Check T4, T5B and other associated components.	Check C88, T2, R4, R67 and other associated components.

INSUFFICIENT SWEEP

Check adjustment of vertical size and linearity controls. Proceed as outlined under "Loss of Sweep".

COMPRESSED AT BOTTOM

Check by substitution V12 and V14. Check T4, T5B, C2C and other associated circuit components.

COMPRESSED AT TOP

Check by substitution V12 and V14. Check T2, C86, C88, R67, R4 and other associated components.

FOLDS

Check by substitution V12 and V14. Check components associated with V12B and V14 for failure or change of value.

SYNC

LOSS OF VERTICAL AND HORIZONTAL SYNC

Check by substitution V12 and V13. Check C77, C78, C79, C80, R57, R58, R59 and other associated components.

LOSS OF VERTICAL SYNC- HORIZONTAL SYNC SATISFACTORY

Check by substitution V12 and V13. Check waveform W6.

If Satisfactory	If Unsatisfactory
Check components associated with V12B especially T2, C85, and R5.	Check C81, C82, C84, R95, R96 and other associated components.

LOSS OF HORIZONTAL SYNC - VERTICAL SYNC SATISFACTORY

Check by substitution V10 and V15 . Check components associated with V10B and V15 especially C90, C92, C93, C95, C94, C91, C98, C99, R73, R74, R75, R77, R78, R79, L34 and C100.

HORIZONTAL BENDING

Check by substitution V10, V15 and V16. Check horizontal AFC filter network components for failure or change of value.

VIDEO

LOSS OF VIDEO

Check C62, R46, picture tube and other associated components for failure or change of value.

SOUND BARS (4.5MC Beat)

Adjust tuner fine tuning for best picture and sound. Check adjustment A-11. Check video IF alignment.

POOR CONTRAST

Substitute V7. Check video detector assembly. Check picture tube and other associated components.

NEGATIVE PICTURE

Substitute V7, V6, V5, V4 and V2. Check video detector assembly. Check AGC network. Check picture tube.

SMEAR

Check by substitution V7,V6, V5, V4 and V2. Check video detector assembly. Check C54, C62, R36, R41, R46, L29, L31, picture tube and other associated components.

WIDE BLACK BAR ACROSS PICTURE

Check V2, V4, V5, V6 and V7 for heater to cathode leakage. In case of UHF, check V1.

AUDIO

WEAK OR NO SOUND

Check by substitution V8, V9, V10 and V11. Check stages V10A and V11 using audio signal generator. Apply audio signal across R1B.

If Satisfactory	If Unsatisfactory
Check ratio detector and audio IF alignment and components.	Check components associated with V10A and V11 especially C74, C75 and T7.

BUZZ

Adjust tuner fine tuning for best picture and sound. Adjust A10 for minimum buzz. If still unsatisfactory, substitute V9 and realign ratio detector and audio IF stages. Check C6 for leakage.

DISTORTED

Follow procedure outlined under "Weak or No Sound".

PARTS LIST AND DESCRIPTIONS

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: SENTINEL PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1A	UHF Oscillator	6AF4	6AF4	7DK	
B	UHF Oscillator	6T8	6T8	9E	
V2A	RF Amplifier	6BQ7A	6BQ7A	9AJ	
B	RF Amplifier	6BZ7	6BZ7	9AJ	
V3	Converter	6J6	6J6	7BF	
V4	1st Video IF Amp.	6CB6	6CB6	7CM	
V5	2nd Video IF Amp.	6CB6	6CB6	7CM	
V6	3rd Video IF Amp.	6CB6	6CB6	7CM	
V7	Video Output	6CL6	6CL6	6CL6	
V8	Sound IF Amp.	6AU6	6AU6	7BK	
V9	Ratio Detector	6AL5	6AL5	6BT	
V10	AF Amplifier Horiz. AFC	6SN7GT	6SN7G1	8BD	
V11	Audio Output	6W6GT	6W6GT	7S	
V12	Sync Separator-Vert. Oscillator	12BH7	12BH7	9A	
V13	Sync Amplifier-Sync Phase Inv.	6SN7GT	6SN7GT	8BD	
V14	Vert. Output	6BL7GT	6BL7GT	8BD	
V15	Horiz. Mult	6SN7GT	6SN7GT	8BD	
V16	Horiz. Qutput	6CD6G	6CD6G	5BT	
V17	Damper	6V3	6V3	9BD	
V18	Damper	6V3	6V3	9BD	
V19	HV Rectifier	1B3GT	1B3GT	3C	
V20	LV Rectifier	5U4G	5U4G	5T	
V21	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: SENTINEL PART No.	SYLVANIA PART No.	GENERAL ELECTRIC PART No.	WESTINGHOUSE PART No.	RETMA BASE TYPE	NOTES
V22A	24TP4-24CP4A	24CP4A	24CP4A	24CP4A	12D	
		24CP4			12N	
B	27EP4A				12D	
		27EP4			12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SENTINEL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	350	25E64	AFH3-159		C118		FP375	TVL-3764	
B	■40	350								
C	▲100	200								
C2A	▲20	350		AFH4-83		D050		FP432.9	TVL-3817	
B	■10	350	25E71							
C	▲100	50								
C3A	60	250	25E62	PRS450/60		BR6025		TC68	R1291	
B	5	250		PRS250/4		BR425		TC50X		
C4	20	450	25E64	PRS450/20		BR2045		TC75	TVA-1709	
C5	10	50	25E66	PRS50/10		BR105		TC32	TVA-1304	
C6	10	50	25E66	PRS50/10		BR105		TC32	TVA-1304	
C7	1			SI1NP0	TCZ-1	TZ03	NP0K-010		5TCCB-V1	
C8	1			SI1NP0	TCZ-1	TZ03	NP0K-010		5TCCB-V1	
C9	2.7									
C10	.8-6.5									
C11	.25									
C12	.8-6.5									
C13	2.5									
C14	2.2									
C15	6									
C16	3-10									
C17	.42									
C18	70			SI68	D6-680	TP32	GP1K-680	UC-5468	5GA-Q68	
C19	70			SI68	D6-680	TP32	GP1K-680	UC-5468	5GA-Q68	
C20	70			SI68	D6-680	TP32	GP1K-680	UC-5468	5GA-Q68	
C21	3-9				829-10					
C22	3			SI3NP0		Z007	NP0-831-3	ZT-553	5TCCB-V3	
C23	.5-3				829-3		3115-01-0R5	CT565A		
C24	68			SI68	D6-681	G038	811-680	UC-5468	5GA-Q68	
C25	800			EF-001	MFT-1000				503C-D1	
C26	1.5			SI1.5NP0	TCZ-1.5	Z004	NP0K-1R5	ZT-5515	5TCCB-V15	
C27	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C28	800			EF-001	MFT-1000				503C-D1	
C29	800			EF-001	MFT-1000				503C-D1	
C30	800			EF-001	MFT-1000				503C-D1	
C31	47			BPD-000047	D6-470	G033	801-470	UC-5447	5GA-Q47	
C32	.5-3				829-3		3115-01-0R5	CT565A		
C33	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C34	10			SI10NP0	TCZ-10	Z018	NP0K-100	ZT-541	5TCC-Q1	
C35	5									
C36	6.8			SI6.8NP0	TCZ-6.8	Z013	NP0K-6R8	ZT-5568	5TCCB-V68	
C37	800			BPD-0008	DD-801	K067	801-001	DC-521	5GA-T8	
C38	800									
C39	120			BPD-00012	D6-120	G044	GP1K-121	UC-5312	5GA-T12	
C40	100			SI100N750	TCN-100	TN22	N750L-101	NT-531	5TCU-T1	
C41	1000		23E2025-3	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C42	470		23E2027-14	SI470	D6-471	TP46	GP2K-471	UC-5347	5GA-T47	
C43	1000		23E2025-3	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C44	10000		23E2025-3	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C45	15			SI15	D6-150	TP11	GP1K-150	UC-5415	5GA-Q15	
C46	470		23E2027-14	SI470	D6-471	TP46	GP2K-471	UC-5347	5GA-T47	
C47	1000		23E2025-3	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C48	15			SI15	D6-150	TP11	GP1K-150	UC-5415	5GA-Q15	
C49	680		23E2027-11	SI680	D6-681	TP50	GP2K-681	UC-5368	5GA-T68	
C50	680		23E2027-11	SI680	D6-681	TP50	GP2K-681	UC-5368	5GA-T68	
C51	1000		23E2025-3	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C52	3		23E20	SI3NP0		TP05	NP0K-030	ZT-553		

PROPERTY OF
L. L. BLANKENSHIP
1 MEADE ST.

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA SENTINEL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C53	.25	100	23E122	P288-25		CUB2P25		PT4025	2TM-P25	
C54	.1	200	23E3216	P288-1		CUB2P1		PT401	2TM-P1	
C55	.0012	200	23E3406	P288-0022	D6-322	CUB2D22	GP2-333-322	PT4322	2TM-D22	
C56	1000		23E2027-12	BL1000	D6-102	TP62	GP2K-102	UC-521	5GA-D1	
C57	.0033	200	23E3406	P288-0033	D6-332	CUB2D32	GP2-333-332	PT4032	2TM-D32	
C58	1000		23E2027-12	BL1000	D6-102	TP62	GP2K-102	UC-521	5GA-D1	
C59	5000		23E2035	BPD-005	DD-502	K080	81L-005	DC-525	5HK-D5	
C60	470		23E2027-16	BL470	D6-471	TP46	GP2K-471	UC-5347	5GA-T47	
C61	30		23E23	BL30	D6-300	TZ17	GP1K-300	PT401	5GA-Q3	
C62	.1	400	23E3418	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C63	2.2		23E21		TCZ-2.2	TZ25	NP0K-2R2		5TCCB-V22	
C64	20		23E22	BL20NP0	TCZ-20	TZ13	NP0K-200	ET-542	5TCC-Q2	
C65	5000		23E2035	BPD-005	DD-502	K080	81L-005	DC-525	5HK-D5	
C66	5000		23E2035	BPD-005	DD-502	K080	81L-005	DC-525	5HK-D5	
C67	1000			BPD-0001	DD-101	G042	81L-101	UC-531	5GA-T1	
C68	470	500	23E2300-40	1465-0005		K060	81L-005	DC-525	5HK-D5	
C69	1000		23E2025-3	BPD-0001	DD-101	G042	81L-101	UC-531	5GA-T1	
C70	1000		23E2027-9	BL1000	D6-102	TP62	GP2K-102	UC-521	5GA-D1	
C71	5000		23E2035	BPD-005	DD-502	K080	81L-005	DC-525	5HK-D5	
C72	.0033	400	23E3407	P488-0033	D6-332	P3D33	GP2-333-332	PT4333	5TM-D33	
C73	.039	400	23E3423			PM4339				
C74	.0047	400	23E3408	P488-0047	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C75	.0047	600	23E3808	P588-0047	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C76	5000		23E2035	BPD-005	DD-502	K080	81L-005	DC-525	5HK-D5	
C77	150		23E2027-10	BL150	D6-151	SW5T47	GP2K-151	UC-5315	5GA-T15	
C78	.01	400	23E3410	P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C79	30		23E23	BL30	D6-300	TZ17	GP1K-300		5GA-Q3	
C80	.047	400	23E3414	P488-047	DF-503	CUB4S47		PT4147	4TM-S47	
C81	.0047	400	23E3408	P488-0047	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C82	.0047	400	23E3408	P488-0047	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C83	.0047	400	23E3408	P488-0047	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	Note 1
C84	.01	400		P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	Note 1
C85	.0047	400	23E3408	P488-0047	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C86	.068	400	23E3418	P488-068		CUB4S68				
C87	.01	600	23E3424							
C88	.1	400	23E3416	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C89	.1	400	23E3416	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C90	470	500	23E3500-40	1469-0005		5R5T47		MCB245	MB-35	
C91	470	500	23E3500-40	1469-0005		5R5T47		MCB245	MB-35	
C92	.001	400	23E3404	P488-001	D6-102	CUB2D1	GP2L-102	PT251	2TM-D1	
C93	47		23E2030-15	BL47	D6-470	TP29	GP1K-470	UC-5347	5GA-Q47	
C94	.001	400	23E3404	P488-001	D6-102	CUB2D1	GP2L-102	PT251	2TM-D1	
C95	470	500	23E3500-40	1469-0005		5R5T47		MCB245	MB-35	
C96	.0033	400	23E3407	P488-0033	D6-332	P3D33	GP2-333-332	PT6233	6TM-D33	
C97	.01	600	23E3410	P588-01		CUB6S1		PT611	6TM-S1	
C98	150		23E2027-10	BL150	D6-151	TP36	GP2K-151	UC-5315	5GA-T15	
C99	390	500	23E3500-39	1469-0004		5R5T39		MCB243	MB-34	
C100	3900	500	23E2033-4	1464-004		1R5D39		MCB463	MB-34	
C101	470	500	23E3500-40	1469-0005		5R5T47		MCB245	MB-35	
C102	.01	400	23E3410	P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C103	5000		23E2025	BPD-005	DD-502	K080	81L-005	DC-525	5HK-D5	
C104	.047	400	23E3414	P488-047	DF-503	CUB4S47		PT4147	4TM-S47	
C105	.068	400	23E3415	P488-068		CUB4S68				
C106	.068	400	23E3415	P488-068		CUB4S68				
C107	.22	400	23E3418	P488-22		CUB4P23		PT4022	4TM-P22	
C108	500	30000	23E2039-3			MMU30T5				Note 2
C109	82	2000	23E2025-8							
C110	5000		23E2025	BPD-005	DD-502	K080	81L-005	DC-525	5HK-D5	
C111	.01	500	23E3610	692ZX-01		CUB6S1		PT611	6TM-S1	
C112	.01	500	23E3610	692ZX-01		CUB6S1		PT611	6TM-S1	
C113	5000		23E2025	BPD-005	DD-502	K080	81L-005	DC-525	5HK-D5	
C114	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	Note 2

Note 1. Some Models combine C83 and C84 in one .015MFD unit in this application.
Note 2. Not used in all Models.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SENTINEL PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1500Ω	½	23E99	*QJ-503				Contrast - tapped ⑤ 187Ω-Panel
B	1MEG	½	Not Req.					Volume & switch tapped ⑤ 375Ω-rear
R2	1MEG	½	23E100					Tone control & switch
R3A	2000Ω	½	23E97	QJL-110	AG-1-S	AB-S	U-S	Vert. Linearity
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R3A
R4A	5MEG with 1MEG stop	½	23E98	QJL-141	AG-S5-S	AB-S7	SU-97	Vert. Size -Note 1
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R4A
R5A	650KΩ with 350KΩ stop	½	23E90	QJL-133	AG-S5-S	AB-S9	SU-54	Vert. Hold - Note 2
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R5A
R6A	5MEG with 100KΩ stop	½	23E87	QJL-141	AG-S5-S	AB-S7	SU-97	Brightness
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R6A

* CONCENTRIKIT EQUIVALENT KIT K-2 BASE ELEMENTS & SHAFTS B17-109XX & P6-224 (Panel) B13-137X & R9-314 (Rear) & Switch 76-1.

Note 1. Connect a 1MEG resistor in series with the left hand terminal of the control and the lead connecting to the same terminal of the original control.(Control viewed from shaft end, terminals down).
Note 2. Connect a 360KΩ resistor in series with the left hand terminal of the control and the lead connecting to the same terminal of the original control. (Control viewed from shaft end, terminals down).

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA SENTINEL PART No.	IRC PART No.	NOTES
R1	470KΩ	½	27E474-2	BTS-470K	
R2	470KΩ	½	27E474-2	BTS-470K	
R3	12KΩ	½	27E123-2	BTS-12K	
R4	15KΩ	½	27E153-2	BTS-15K	
R5	47KΩ	½	27E473-2	BTS-47K	
R6	330KΩ	½	27E1009-24	BTS-330K	
R7	220KΩ	½	27E1009-6	BTS-220K	
R8	470Ω	½	27E471-2	BTS-470	
R9	15KΩ	½	27E153-2	BTS-15K	
R10	220KΩ	½	27E224-2	BTS-220K	
R11	10KΩ	½	27E103-2	BTS-10K	
R12	220KΩ	½	27E224-2	BTS-220K	
R13	22KΩ	½	27E223-2	BTS-22K	
R14	470Ω	½	27E471-2	BTS-470	
R15	15KΩ	½	27E153-2	BTS-15K	
R16	220KΩ	½	27E224-2	BTS-220K	
R17	10KΩ	½	27E103-2	BTS-10K	
R18	22KΩ	1	27E223-52	BTA-22K	
R19	33000Ω	2	27E333-5	BTB-3300	Note 1
R20	15KΩ			BTS-15K	
R21	220KΩ	½	27E223-2	BTS-220K	
R22	1000Ω	½	27E102-2	BTS-1000	
R23	22KΩ	½	27E223-2	BTS-22K	
R24	100Ω	½	27E102-2	BTS-1000	
R25	47Ω	½	27E470-2	BTS-47	
R26	1000Ω	½	27E102-2	BTS-1000	
R27	18KΩ	½	27E183-2	BTS-18K	
R28	1000Ω	½	27E102-2	BTS-1000	
R29	56Ω	½	27E560-2	BTS-56	
R30	1000Ω	½	27E102-2	BTS-1000	
R31	18KΩ	½	27E183-2	BTS-18K	
R32	120Ω	½	27E121-2	BTS-120	
R33	1000Ω	½	27E102-2	BTS-1000	
R34	1.5MEG	½	27E155-2	BTS-1.5MEG	
R35	5600Ω 5%	½	27E1009-8	BTS-5600 5%	
R36	470KΩ	½	27E474 -2	BTS-470K	
R37	270Ω	½	27E271-2	BTS-270	
R38	18KΩ	2	27E183-5	BTB-18K	
R39	5600Ω 5%	½	27E1009-8	BTS-5600 5%	
R40	1800Ω	½	27E182-2	BTS-1800	
R41	4000Ω	5	27E1023	1 3/4A-4000	
R42	10KΩ	½	27E103-2	BTS-10K	
R43	10KΩ	1	27E103-3	BTA-10K	
R44	680KΩ	½	27E684-2	BTS-680K	
R45	2.2MEG	½	27E225-2	BTS-2.2MEG	
R46	100KΩ	½	27E1009-10	BTS-100K	
R47	4700Ω	½	27E473-2	BTS-4700	
R48	150Ω	½	27E151-2	BTS-150	
R49	10KΩ	½	27E103-2	BTS-10K	
R50	470Ω	½	27E471-2	BTS-470	
R51	33KΩ	½	27E333-2	BTS-33K	
R53	10KΩ 5%	½	27E1009-55	BTS-10K 5%	
R54	68KΩ	½	27E683-2	BTS-68K	
R55	1200Ω	½	27E122-2	BTS-1200	
R56	33KΩ	½	27E333-3	BTA-33K	
R57	1.2MEG	½	27E1009-5	BTS-1.2MEG	
R58	100KΩ	½	27E104-2	BTS-100K	
R59	100KΩ	½	27E104-2	BTS-100K	
R60	470KΩ	½	27E474-2	BTS-470K	
R61	180KΩ	½	27E1009-50	BTS-180K	
R62	2200Ω	½	27E222-2	BTS-2200	
R63	1 MEG	½	27E105-2	BTS-1 MEG	
R64	6800Ω	½	27E682-2	BTS-6800	
R65	33000 5%	½	27E332-2	BTS-3300 5%	
R66	3300Ω	½	27E332-2	BTS-3300	
R67	2.2MEG	½	27E225-2	BTS-2.2MEG	
R68	100Ω	½	27E101-2	BTS-100	
R69	270Ω	½	27E271-3		
R70	1000Ω	½	27E102-2	BTB-1000	
R71	680Ω	½	27E681-2	BTS-680	
R72	680Ω	½	27E681-2	BTS-680	
R73	82KΩ	½	27E823-2	BTS-82K	
R74	82KΩ	½	27E823-2	BTS-82K	
R75	100KΩ	½	27E1009-10	BTS-100K	
R76	4.7MEG	½	27E475-2	BTS-4.7MEG	
R77	100KΩ	½	27E1009-10	BTS-100K	
R78	33KΩ	½	27E333-2	BTS-33K	
R79	33KΩ	½	27E333-2	BTS-33K	
R80	1200Ω	½	27E122-2	BTS-1200	
R81	5600Ω 5%	½	27E1009-8	BTS-5600 5%	
R82	100KΩ	½	27E1009-10	BTS-100K	
R83	120KΩ	½	27E1009-47	BTS-120K	
R84	5600Ω	½	27E1009-8	BTS-5600	
R85	1 MEG	½	27E105-2	BTS-1 MEG	
R86	82Ω	½	27E820-2	BTS-82	
R87	470Ω	½	27E471-2	BTS-470	
R88	8700Ω	5	27E1016-20		
R89	220KΩ	½	27E224-2	BTS-220K	
R90	220KΩ	½	27E224-2	BTS-220K	
R91	680K	½	27E684-2	BTS-680K	
R92	2200Ω	½	27E222-2	BTS-2200	
R93	8.2Ω				
R94	220KΩ	½	27E224-2	BTS-220K	
R95	22KΩ	½		BTS-22K	
R96	10KΩ	½		BTS-10K	
R97	22KΩ	½		BTS-22K	Note 1

Note 1. Not used in all models.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA SENTINEL PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	RCA TYPE No.	Halldorson PART No.	Thordorson PART No.
T1	117VAC @2.19A	534VCT .290ADC	5VAC ④ 6A	22E86B						
	SEC. 3	SEC. 4	SEC. 5							
	6.3VAC ③3.6A	6.3VAC ④ 11.5A								

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA SENTINEL PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	RCA TYPE No.	Halldorson PART No.	Thordorson PART No.
T2	Vert. Osc. Trans.	22E70	A-8125①	A-3003 ①	A-97X①		B6702①	TV-34A87 ①④
T3	Horiz. Output Trans.	22E84-F 22E84 ③						
T4	Vert. Output Trans.	22E81	A-8142④⑦		A-108X			
T5A	Yoke-Horiz. (1.3MH)	22E814-2		MDF-90④	Y-80④	21GD1④		
B	Yoke-Vert. (90MH)	22E914 ⑤						
T6	Horiz. Linearity (1.5-6.7MH)	20E820						

① Connect blue lead to cathode, red lead to ground, yellow lead to grid, and green lead to integrator network.
② Drill one new mounting hole.
③ Alternate horizontal output trans.
④ Drill new mounting holes.
⑤ Alternate yoke.
⑥ Use original yoke network.
⑦ Connect as auto transformer.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA SENTINEL PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordorson PART No.	NOTES
T7	2.6KΩ	3.5Ω	22E71	A-3876	A-2928	S-2X	Z1005		

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	REPLACEMENT DATA SENTINEL PART No.	VIKING PART No.	QUAM PART No.	NOTES
SP1A	10"	PM	3.5Ω	1E43-2	10J11	10A31	① Used in Models 552, 554, 562 and 564
B	12"	PM	3.5Ω	1E51-2①	L-J11	12A31	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA SENTINEL PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1A	UHF Ant. Coil	0Ω						
B	UHF Mixer Coil	0Ω						
C	UHF Osc. Coil	0Ω						
L2	UHF Ant. Coil End							
	Inductor	0Ω						
L3	UHF Mixer Coil End							
	Inductor	0Ω						
L4	UHF Osc. Coil End							
	Inductor	0Ω						
L5	FIL. Choke	.2Ω		M-227				
L6	FIL. Choke	.2Ω		M-228				
L7	Cathode Choke	0Ω		M-326				
L8	RF Choke	0Ω		M-225				
L9	UHF IF Coupling	0Ω		M-324				
L10	UHF IF Output Coil	0Ω	0Ω	M-229				
L11	I F Trap	0Ω		20E889				Wound on 68 MMF cap.
L12	I F Trap	0Ω		20E890				Wound on 68 MMF cap.
L13A	VHF Ant. Coil	OOCT	0Ω	21M-012-2				Channel 2
B	VHF Ant. Coil	OOCT	0Ω	21M-012-3				Channel 3
C	VHF Ant. Coil	OOCT	0Ω	21M-012-4				Channel 4
D	VHF Ant. Coil	OOCT	0Ω	21M-012-5				Channel 5
E	VHF Ant. Coil	OOCT	0Ω	21M-012-6				Channel 6
F	VHF Ant. Coil	OOCT	0Ω	21M-012-7				Channel 7
G	VHF Ant. Coil	OOCT	0Ω	21M-012-8				Channel 8
H	VHF Ant. Coil	OOCT	0Ω	21M-012-9				Channel 9
I	VHF Ant. Coil	OOCT	0Ω	21M-012-10				Channel 10
J	VHF Ant. Coil	OOCT	0Ω	21M-012-11				Channel 11
K	VHF Ant. Coil	OOCT	0Ω	21M-012-12				Channel 12
L	VHF Ant. Coil	OOCT	0Ω	21M-012-13				Channel 13
M	UHF Ant. Strip	0Ω	0Ω	21M-113-1Q				Used in UHF operation only
L14	FIL. Choke	0Ω		34A-546				
L15	Neutr. Coil	0Ω		31B-529				
L16A	VHF RF, Mixer grid & Osc. Coil	0Ω		21M-112-3				Channel 3
B	VHF RF, Mixer grid & Osc. Coil	0Ω		21M-112-3				Channel 3
C	VHF RF, Mixer grid & Osc. Coil	0Ω		21M-112-4				Channel 4
D	VHF RF, Mixer grid & Osc. Coil	0Ω		21M-112-5				Channel 5
E	VHF RF, Mixer grid & Osc. Coil	0Ω		21M-112-6				Channel 6
F	VHF RF, Mixer grid & Osc. Coil	0Ω		21M-112-7				Channel 7
G	VHF RF, Mixer grid & Osc. Coil	0Ω		21M-112-8				Channel 8
H	VHF RF, Mixer grid & Osc. Coil	0Ω		21M-112-9				Channel 9
I	VHF RF, Mixer grid & Osc. Coil	0Ω		21M-112-10				Channel 10
J	VHF RF, Mixer grid & Osc. Coil	0Ω		21M-112-11				Channel 11
K	VHF RF, Mixer grid & Osc. Coil	0Ω		21M-112-12				Channel 12
L	VHF RF, Mixer grid & Osc. Coil	0Ω		21M-113-13				Channel 13
M	UHF RF Strip	0Ω	0Ω	21M-113-1R				Used in UHF operation only. Includes 470Ω & 10Ω resistors & 1000MMF capacitor
L17	FIL. Choke	0Ω		34A-575				
L18	RF Choke	0Ω		31B-538-1				
L19	Feedback Coil	1.4Ω		31B-530				
L20	Conv. Plate	0Ω		31B-532				
L21	RF Choke	1.2Ω		34A-580				
L22	1st Video IF	.1Ω		20E857	17-4523 *		6219 *	
L23	2nd Video IF	.1Ω	.1Ω	20E858				Includes trap
L24	3rd Video IF	.1Ω	.1Ω	20E859				Includes trap
L25	4th Video IF	.1Ω	.1Ω	20E860				Includes 5 MMF cap., 1N60 crystal det. (Part # 95E1), & Series Peak. Coil
L26	Series Peak. Coil	2.6Ω		20E883	19-1005		6613	13 Microhenries
L27	Shunt Peak. Coil	17Ω		20E363-10	19-1923		6646	390 Microhenries
L28	RF Choke	1.2Ω		1R92	19-3001	TV-189	6804	L 5 Microhenries; IRC Part # CL4
L29	Series Peak. Coil	12Ω		20E363-25	19-3250	TV-185	6181	270 Microhenries
L30	4.5MC Trap	3.3Ω		20E785	30-1004	TV-181	1470	
L31	Shunt Peak. Coil	19Ω		20E363-26	19-3260			820 Microhenries
L32	Sound IF	3.3Ω		20E785	30-1005	TV-181	1469	
L33	Ratio Det.	4Ω	.7DCT	20E783	17-1033	TV-110	1468	Tertiary winding=. 55Ω
L34	Horiz. Osc.	110Ω		20E831	19-1576	TV-163	6210	

* Use one winding only.

SENTINEL MODELS 1U-532, A, 1U-542, A, 1U-552, 1U-554, 1U-562, 1U-564

PARTS LIST AND DESCRIPTIONS (Continued)

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	SENTINEL PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
L35	.290ADC	73Ω	2.97 Hy.	22E83	C-2326①				

① Drill one new mounting hole.

FUSES

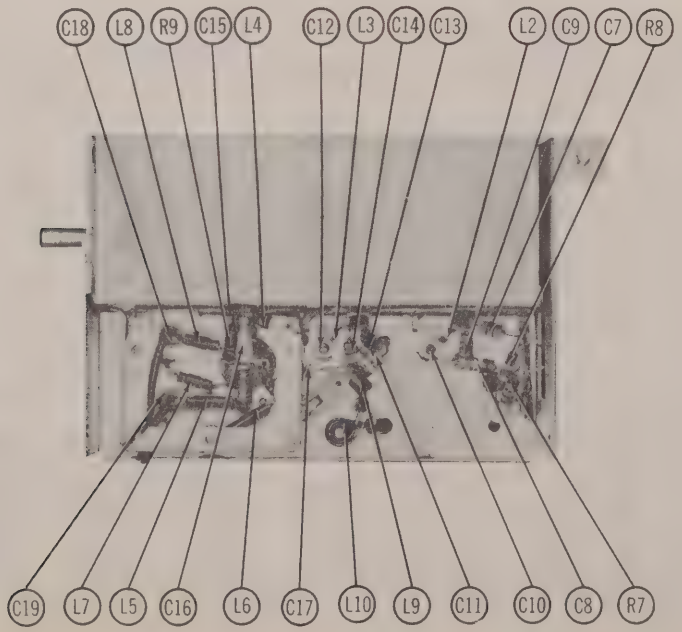
ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			SENTINEL PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG S/B	4A 125V	40E11-8	55E57	313004. (3AG S/B-4A)	342001	MDX4	HKP
M2	3AG S/B	1/4A 250V	40E8-2		313. 250 (3AG S/B-1/4 A)	351011	MDL 1/4	4406

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		SENTINAL PART No.	SYLVANIA PART No.		
M3	1N82		1N82 or A		UHF Mixer (clip-in)
M4	1N60	95E1	1N60		Video Detector (pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	SENTINEL PART No.	NOTES
M5A	Tuner	20E856	VHF Models 532, 552, 554
B	Tuner	20E863	VHF Models 542, 562, 564
M6	Tuner	20E867	UHF Models 542, 562, 564
M7	Switch	29E30	Locality Adjuster (AGC)
M8	Switch	29E31	UHF-VHF changeover
M9	Focus Magnet	62E8	Includes centering device
M10	Ion Trap	15E174-7	
	Cabinet		Order by Model No. & type of finish
	Knob	37E83	Off/On Volume
	Knob	37E83-2	Off/On Volume (Blonde)
	Knob	37E83-3	VHF Channel Selector - Model 542
	Knob	37E83-4	VHF Channel Selector - Model 542 (Blonde)
	Knob	37E84	Contrast (Mahogany & blonde)
	Knob	37E84-3	Fine tuning, (Mahogany & blonde)
	Knob	37E85	Tone
	Knob	37E85-2	Tone (blonde)
	Knob	37E86	"Hi-Lite" Models 552, 554, 562, 564
	Knob	37E86-2	"Hi-Lite" Models 552, 554, 562, 564 (Blonde)
	Knob	37E86-3	"Hi-Lite" Models 532, 542 (Blonde & Mahogany)
	Knob	37E87	Channel Selector - Models 532, 552, 554
	Knob	37E87-2	Channel Selector - Models 532, 552, 554 (Blonde)
	Knob	37E88	UHF Channel Selector - Models 542, 562, 564
	Knob	37E88-2	UHF Channel Selector - Models 542, 562, 564
	Safety Glass	95E45-8	Models 532 & 542
	Safety Glass	95E45-5	Models 552, 554, 562 & 5 64



UHF TUNER BOTTOM VIEW

TROUBLE SHOOTING AIDS (cont)

PROPERTY OF
L. F. LEANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

POWER

DEAD SET

If filaments fail to light, check AC interlock assembly, switch on volume control and T1. If fialments light, substitute V20 and V21. Check C1A, C2A and other B+ filter and decoupling network components.

SMALL AND/OR DIM PICTURE

Substitute V20 and V21. Check B+ filter and decoupling network components.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V15, V16 , V17, V18 and V19. Check waveform W14.

If Satisfactory	If Unsatisfactory
Check T3, T5A, C108, R93 and other associated components.	Check C99, C103, R83, R85 and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V15, V16, V17, V18, V19, V20 and V21. Check picture tube. Prodeed as outlined under "Loss of Sweep".

BLOOMING

Check by substitution V15, V16, V17, V18, V19, V20 and V21. Check C108, R93, T3, T5A, C104 and other associated components. Check picture tube.

GENERAL

RASTER SOUND NO PICTURE

Follow procedure outlined under "Loss of Video".

RASTER PICTURE NO SOUND

Follow procedure outlined under "Weak or No Sound".

RASTER NO SOUND NO PICTURE

Check by substitution V2, V3, V4, V5,V6 and V7. Check video detector assembly. Check components associated with the video IF strip. In case of UHF, check V1.

NO RASTER NO SOUND

Follow procedure outlined under "Dead Set".

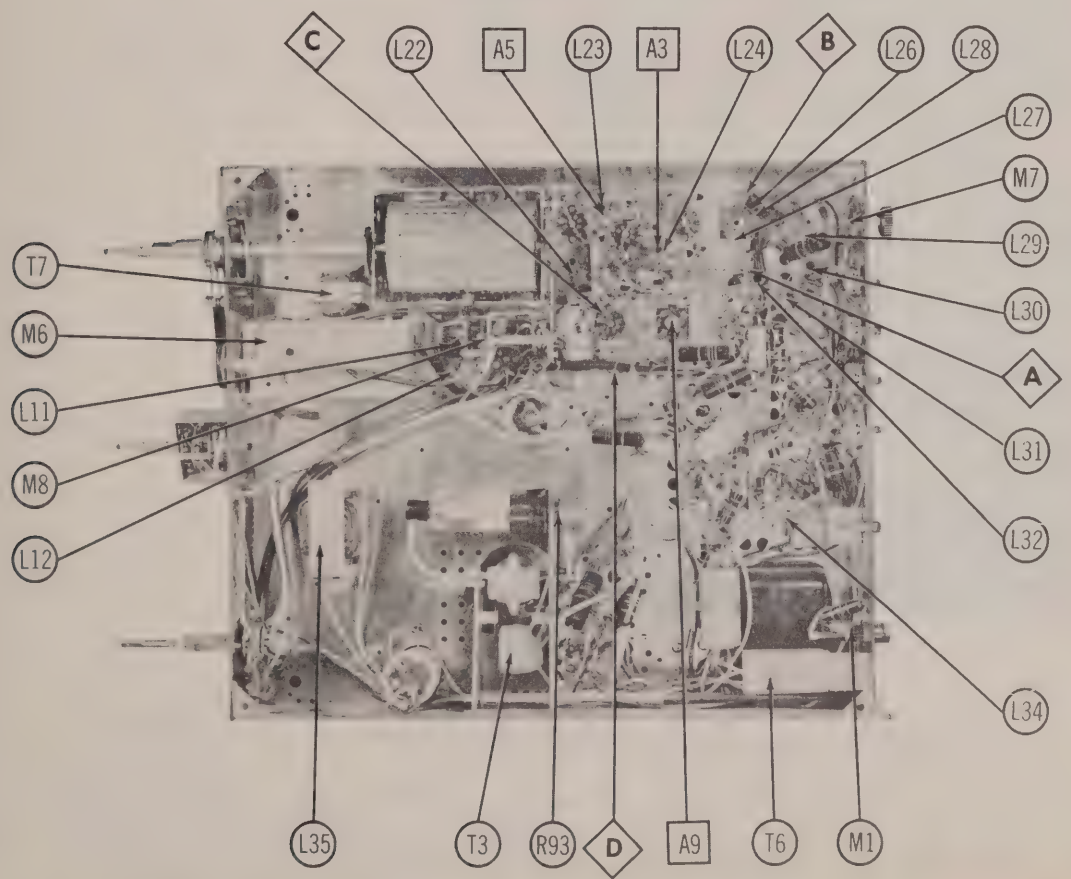
KEYSTONE EFFECT

Check T5, C109, R70, R71 and R72.

INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR & ALIGN. IDENTIFICATION

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the RF tuner oscillator circuit may be accomplished by removal of the channel selector and fine tuning knobs. The adjustments are accessible, one at time, through the small hole in the cabinet to the right of the channel selector shaft.

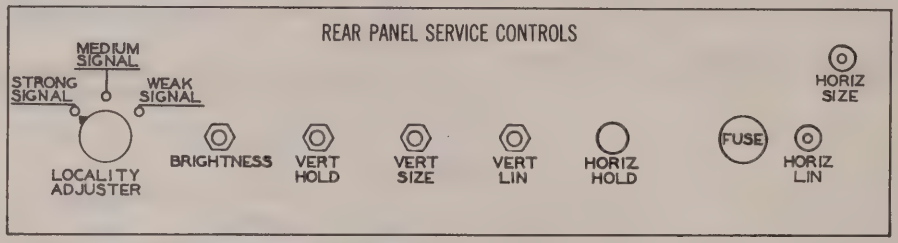
PICTURE TUBE GLASS CLEANING

To clean safety glass remove 5 wood screws holding wood strip at the top of safety glass. Remove wood strip and safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION



HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horizontal oscillator circuit can be made from rear panel of the chassis. Adjust the horizontal hold slug until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (L33) located on top of chassis. (See tube placement chart)

FUSES

Two fuses are used. One for horizontal sweep circuit protection and one for LV power supply protection. (For location, see tube placement chart).

CENTERING

Centering is accomplished mechanically by means of a centering lever on the PM focusing assembly. Adjust the centering lever from side to side, and up and down until the picture is properly centered.

DISASSEMBLY INSTRUCTIONS

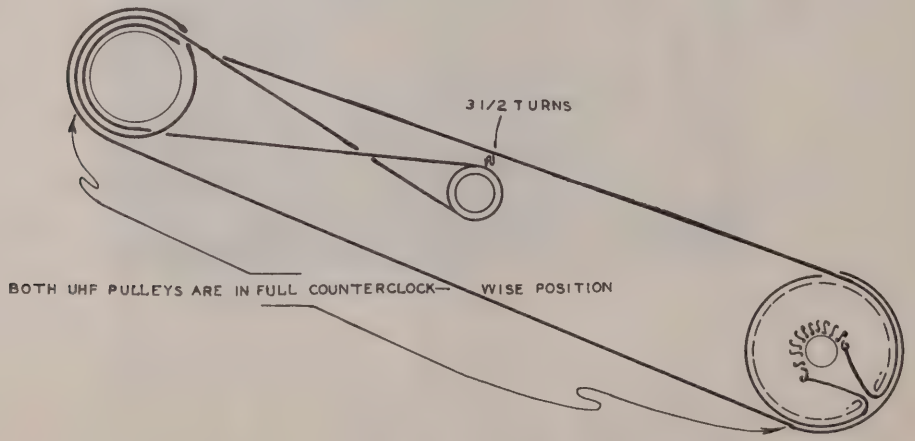
Remove 7 push on type control knobs from front panel.

Remove 9 wood and 1 metal screws. Remove rear cover.

Disconnect transmission line, built-in antenna and speaker leads.

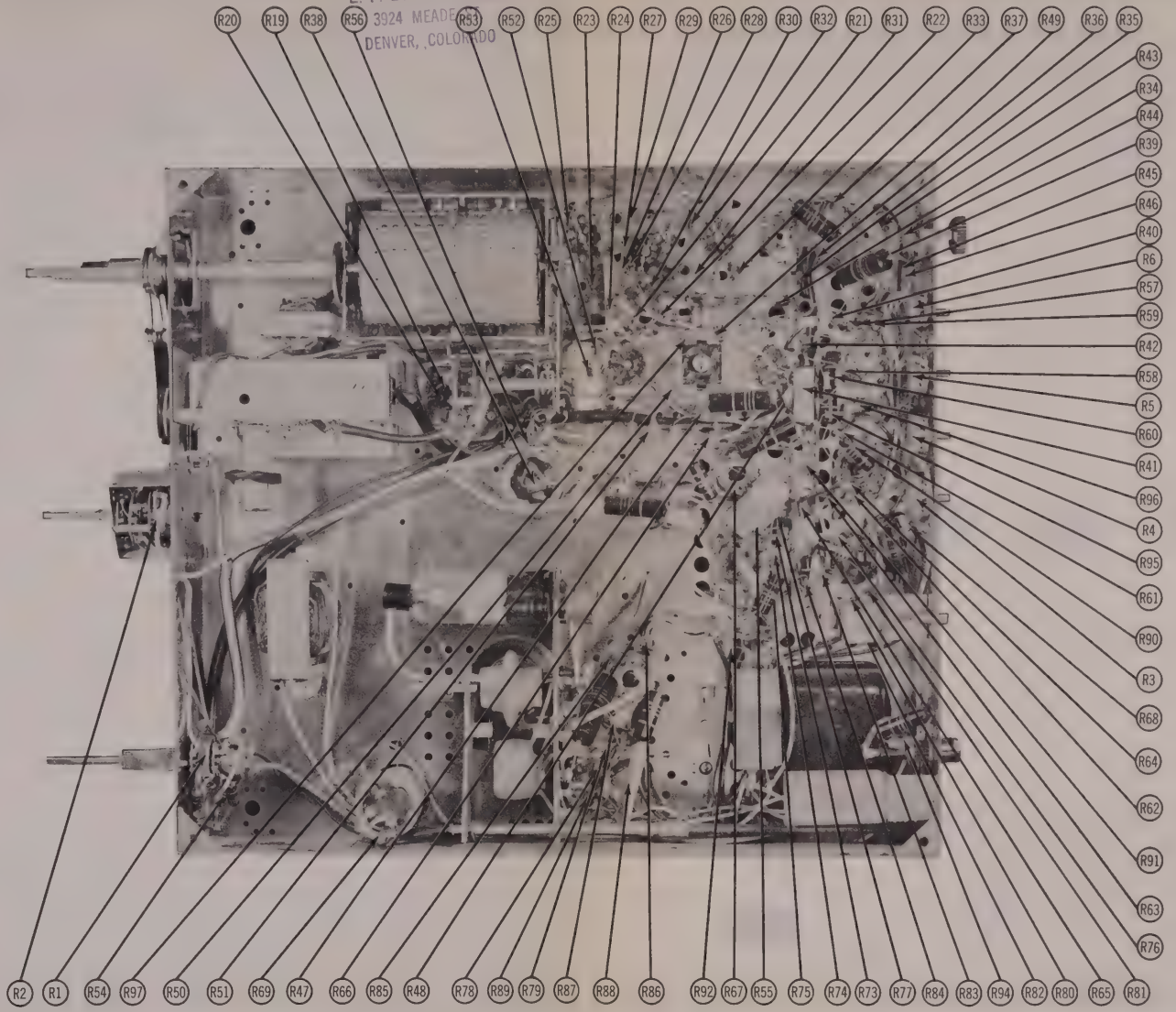
Remove 4 chassis bolts, 2 CRT nuts and bolts. Remove chassis.

Remove 4 speaker nuts. Remove speaker.



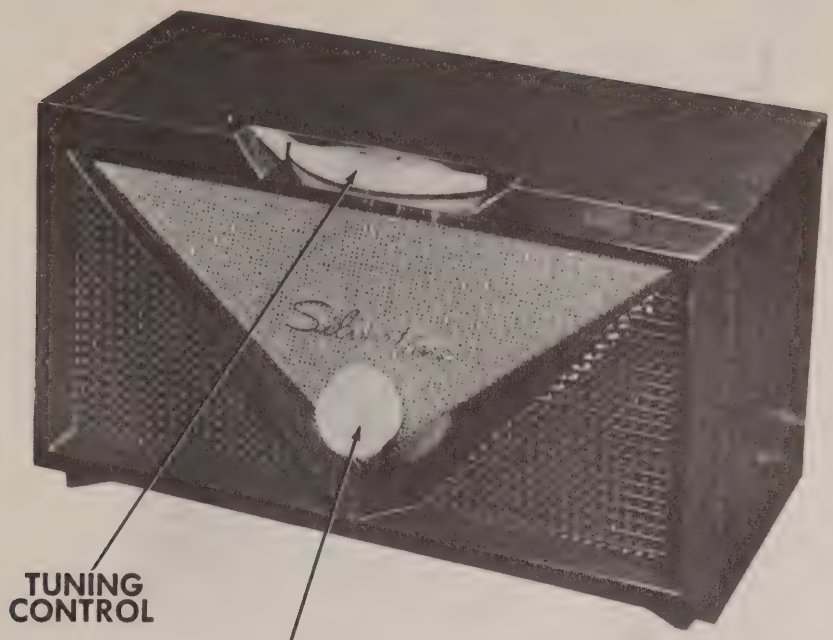
UHF DRIVE CORD STRINGING

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE
DENVER, COLORADO



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

SILVERTONE
MODELS 3001, 3002 (Ch. 132.054)



PROPERTY OF
L. F. ELLIS
3924 MEADE ST.
DENVER, COLORADO

SILVERTONE
MODELS 3001, 3002 (Ch. 132.054)

TRADE NAME	Silvertone Models 3001, 3002 (Ch. 132.054)
SUPPLIER	Sears, Roebuck & Co., 925 South Homan, Chicago, Ill.
TYPE SET	AC-DC Operated AM Superheterodyne Receiver
TUBES (Four)	Types 12BE6 Converter, 12AV6 Det.-AVC-AF Amp., 50C5 Audio Output, 35W4 Rectifier
POWER SUPPLY	105-125 Volts AC-DC RATING .24 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting. With tuning gang fully closed set the right edge of the small "5" in "55" on dial opposite index mark on cabinet.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	50MMF	High side to antenna coil (Remove antenna hank). Low side to B-.	1720KC	"	"	A3	Adjust for maximum output.
3.	"	"	1400KC	Tune to 1400KC signal	"	A4	Rock tuning gang thru 1400KC signal while adjusting for maximum output.
4.	"	"	600KC	Tune to 600KC signal	"		If necessary, bend slotted antenna antenna rotor plates on tuning gang. Repeat steps 2, 3 and 4.

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1954 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

SILVERTONE
MODEL 3001, (Ch. 132. 054)

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: SILVERTONE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	Converter	12BE6	12BE6	7CH	
V2	Det-AVC-AF Amp.	12AV6	12AV6	7BT	
V3	Aduio Output	50C5	50C5	7CV	
V4	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA: Silvertone PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	■40	150	N41102	AFH3-72		C048		FP306	TVL-3422	
B	▲20	150								
C	20	25								
C2	20000			BPD-02	DF-203	K085			5HK-S2	
C3	2000			BPD-002	DD-202	K072	801-002	DC-522	5HK-D2	
C4A	250		♦PC-1	♦PA-112-1	♦PC-70	♦112TM1	♦1406-01		♦104C4	
B										
C	5000									
C5	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C6	20000			BPD-02		K085			5HK-D2	
C7	20000			BPD-02		K085			5HK-D2	

♦ Items C4A, C4B, C4C, R6A and R6B are combined in one unit. When replacing units separately items C4A and C4B should total 250MMF.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA: SILVERTONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	1 Meg	½	N41022					Volume & switch

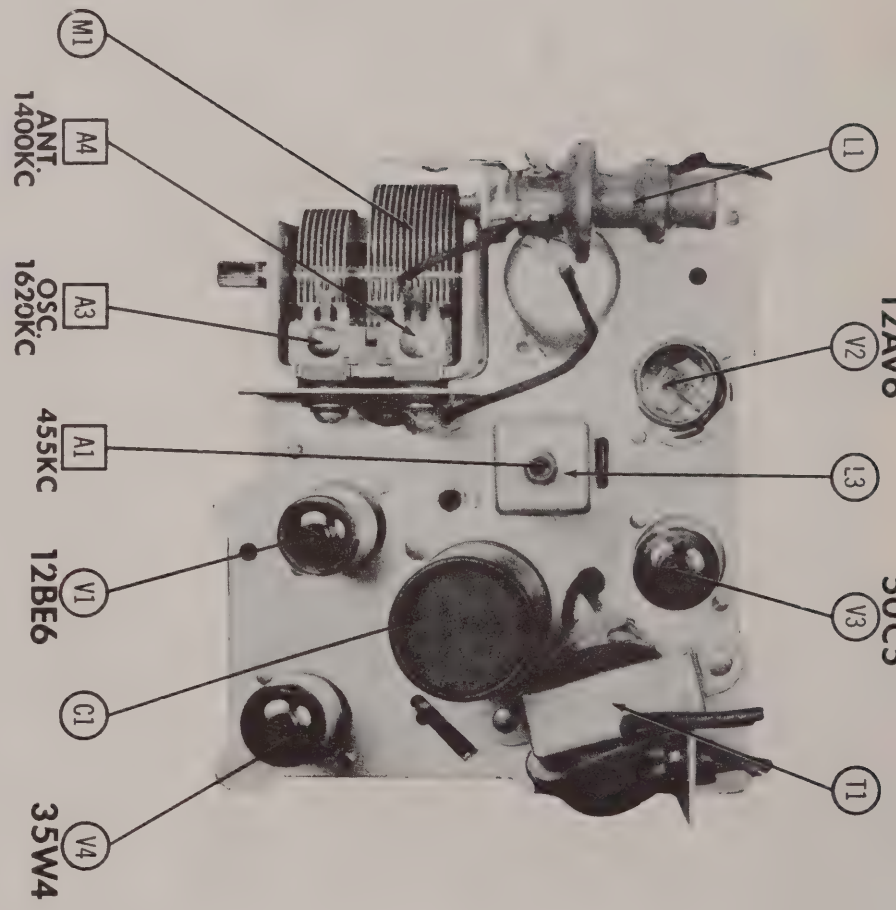
RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA: SILVERTONE PART No.	IRC PART No.	NOTES
R2	330KΩ	½		BTS-330K	
R3	22KΩ	½		BTS-22K	
R4	2. 2Meg	½		BTS-2. 2Meg	
R5	10 Meg	½		BTS-10 Meg	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA: SILVERTONE PART No.	IRC PART No.	NOTES
R6A	470KΩ	½	♦ PC-1	BTS-470K	
B	470KΩ	½		BTS-470K	
R7	120Ω	1		BTS-120	
R8	2200Ω	1		BTA-2200	
R9	47Ω	1			

♦ Items R6A, R6B, C4A, C4B, C4C are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Silvertone PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T1	2.3KΩ	3.2Ω	N41119-1	A-3332①	A-3025①	S-1X ①	Z1101	TS-24S50①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	Silvertone PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.2Ω	N-22875	ST-113 Mod. P4-X	4A07	

COILS (RF-IF)

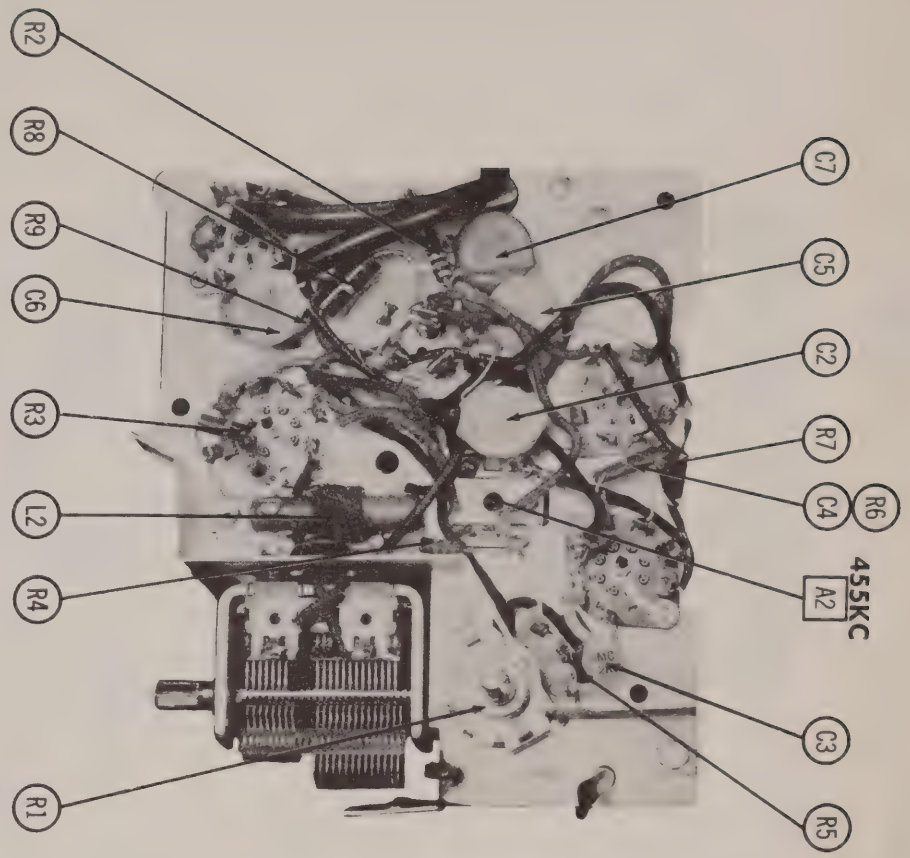
ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	SILVERTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	36Ω	2.9Ω	N22864-1	14-1056	BC-380	72-A	
L2	Osc. Coil	.8Ω	.8Ω	N41106-1	14-1073		69-Osc. †	
L3	IF Trans.	19Ω	19Ω	N41168-2	16-6770 *	BC-355 *	12-C6 *	Prl. tapped @ 2Ω

† Drill mounting hole.
* Connect primary winding across pins 5 & 6 of V1. Connect B+ line to Pin 6 of V1.

MISCELLANEOUS

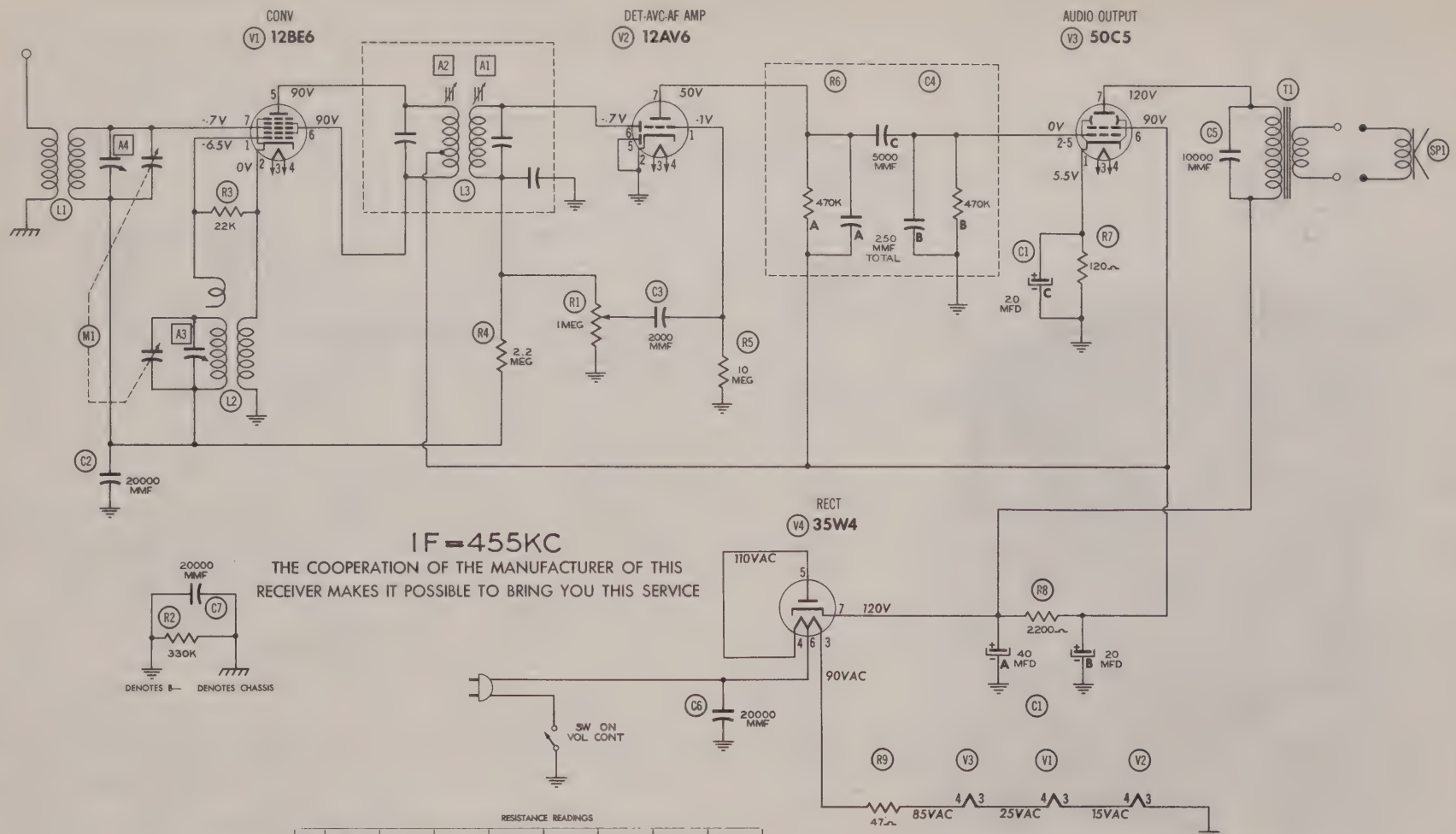
ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M1	Tuning cap	N41089	2 section (26-375MMF) (18-140MMF)
	Cabinet	N41519-1	Brown
	Cabinet	N41519-2	Ivory
	Knob	N41087-1	Ivory-volume
	Knob	N41087-2	Red-volume
	Knob	N41095-1	Ivory-dial
	Knob	N41095-2	Red-dial

CHASSIS—BOTTOM VIEW



PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST
DENVER, COLORADO

SILVERTONE
MODEL 3001, (Ch. 132. 054)



IF=455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

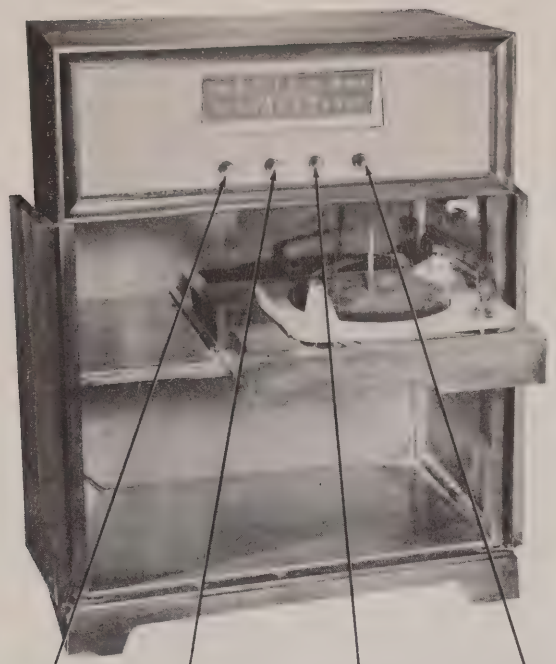
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	.8Ω	14Ω	27Ω	†2.2KΩ	†2.2KΩ	3.2Meg
V 2	12AV6	10Meg	0Ω	0Ω	14Ω	0Ω	1Meg	†470KΩ
V 3	50C5	120Ω	470KΩ	27Ω	77Ω	470KΩ	†2.2KΩ	†180Ω
V 4	35W4	77Ω	0Ω	122Ω	160Ω	160Ω	150Ω	150KΩ

† MEASURED FROM PIN 7 OF V4

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

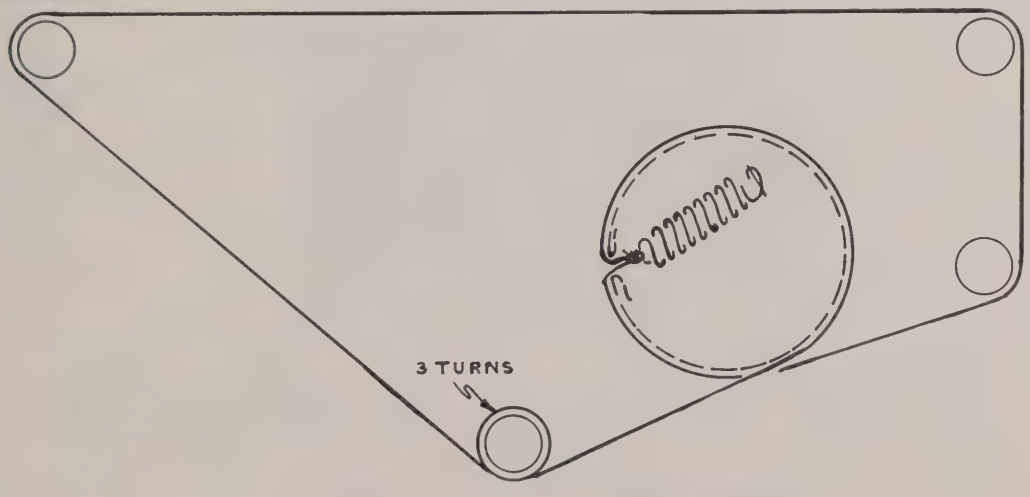
A PHOTOFACT STANDARD NOTATION SCHEMATIC

©Howard W. Sams & Co., Inc. 1954



TRADE NAME	Truetone Models D1435A, D1436A		
SUPPLIER	Western Auto Supply Co., 2107 Grand Ave., Kansas City, Mo.		
TYPE SET	AC Operated AM-FM Superheterodyne Receiver with 3 Speed Record Changer		
TUBES (Eight)	Types 6BJ6 FM RF Amp., 6CB6 FM Converter-AM Oscillator, 6AU6 FM IF Amp.-AM Mixer, 6BA6 AM FM IF Amp., 6AL5 Ratio Detector, 6AV6 AM Det.-AVC-AF Amp., 6AQ5 Audio Output, 6X5 Rectifier		
POWER SUPPLY	105-125 Volts AC-60 Cycles	RATING	.29 Amp. @ 117 Volts AC
TUNING RANGE- BROADCAST	540-1600KC	FREQ. MOD.	88-108MC

FOR SERVICE INFORMATION ON RECORD CHANGER UNIT - SEE PHOTOFACT SET 107 FOLDER 13 OR RECORD CHANGER MANUAL CM-3.



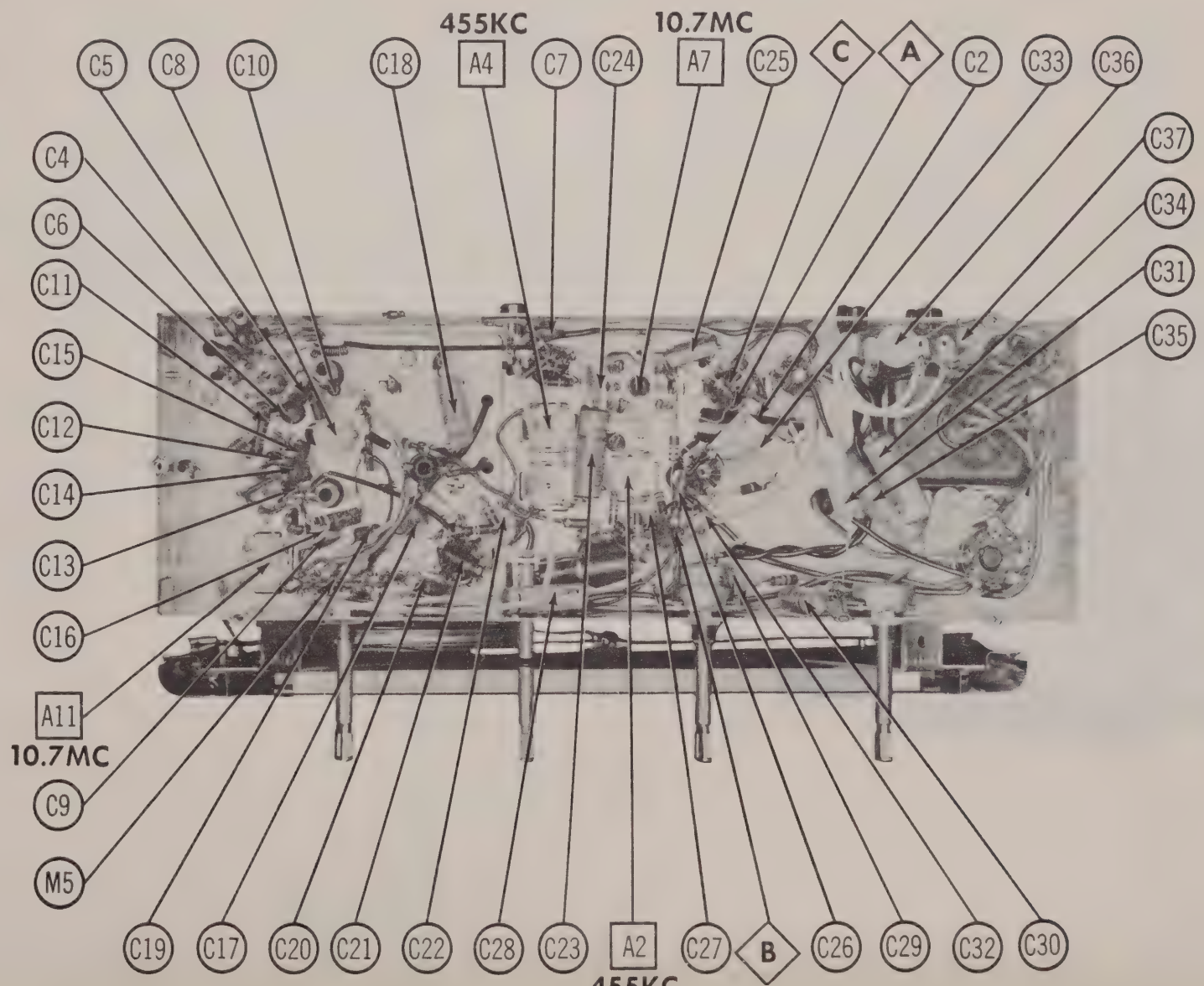
DRIVE CORD STRINGING

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

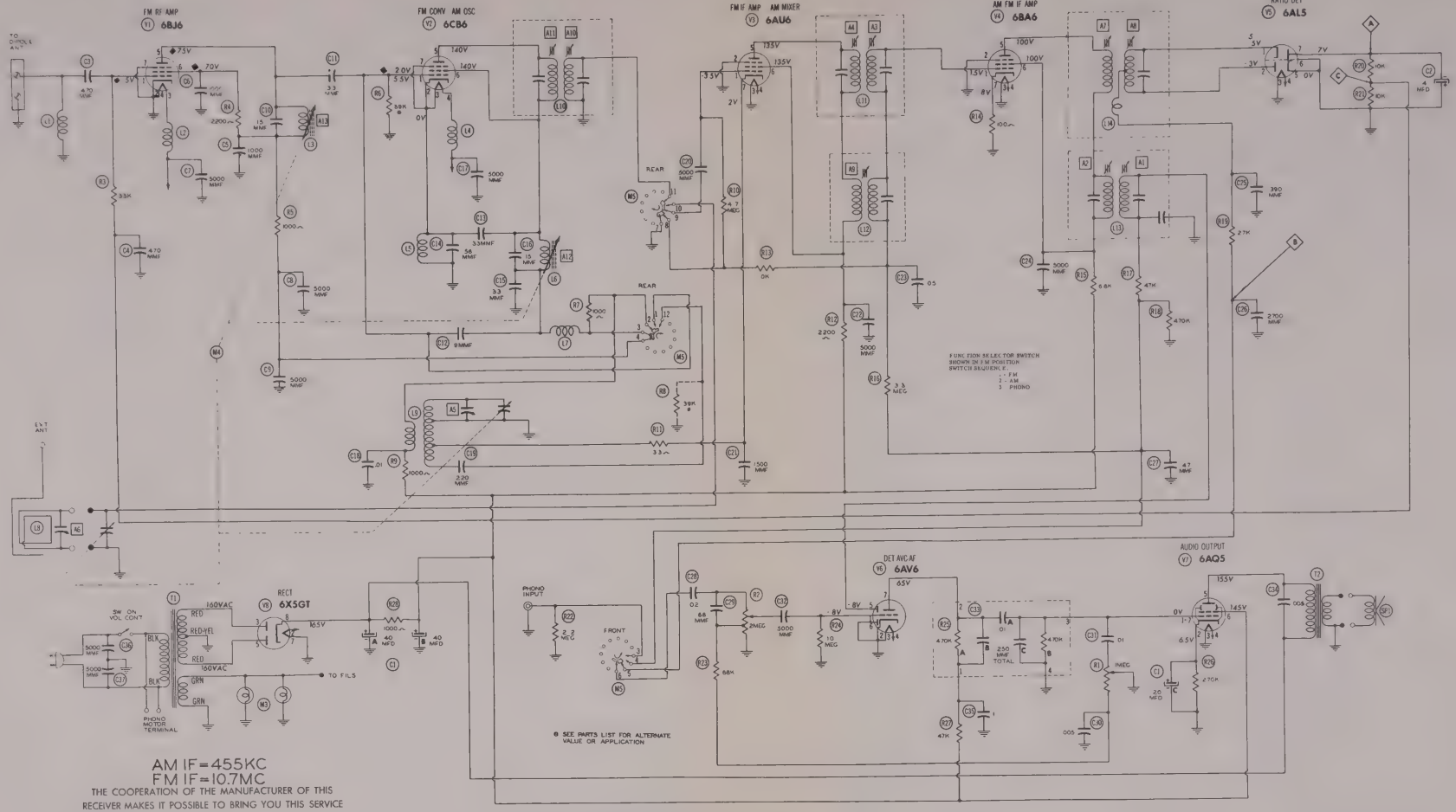
"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1954 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

TRUETONE
MODELS D1435A, D1436A

TRUETONE
MODELS D1435A, D1436A



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



AM IF = 455KC
FM IF = 10.7MC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

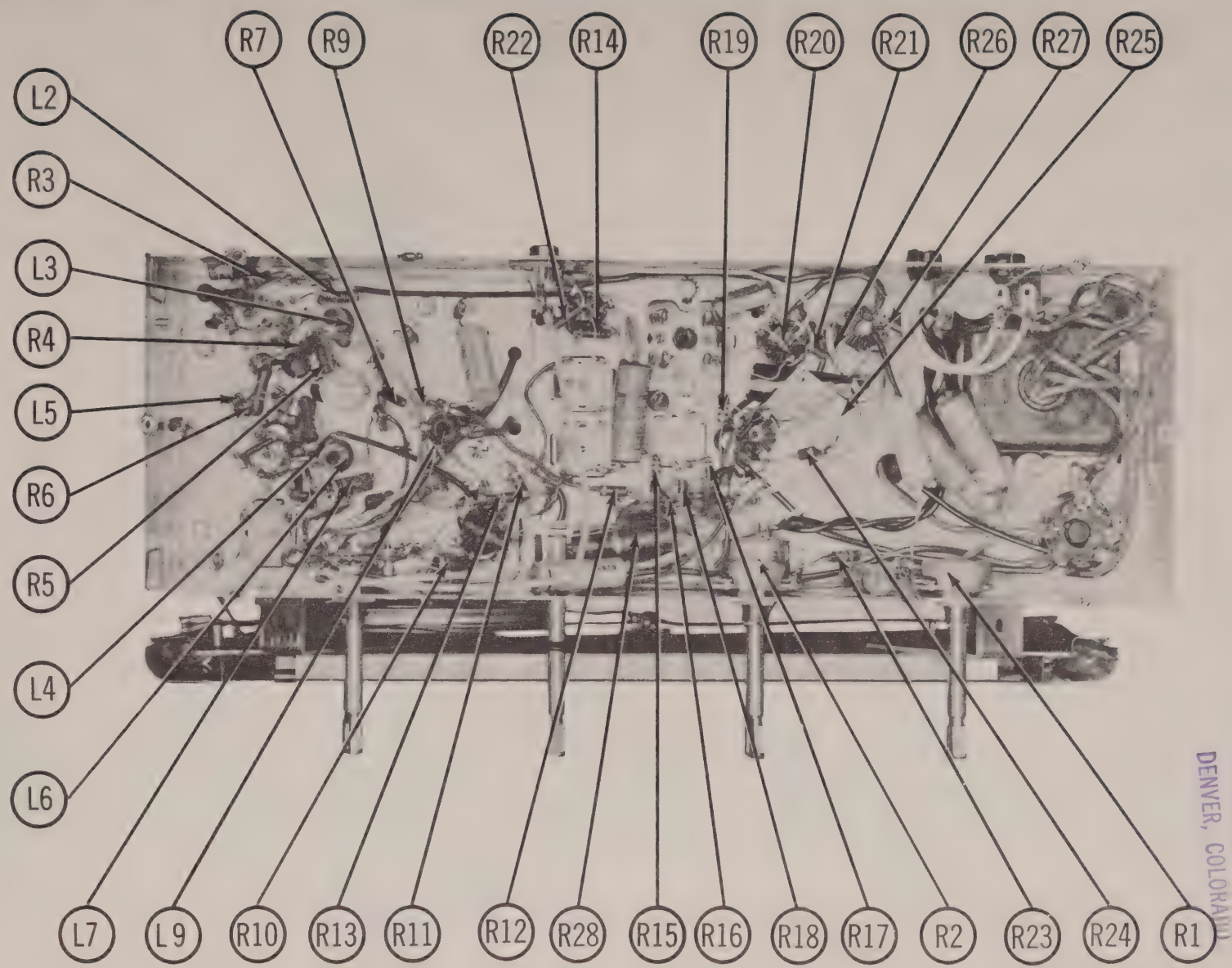
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6BJ6	45KΩ	0Ω	.1Ω	0Ω	7 MEGΩ	↑6.2KΩ	0Ω	
V 2	6CB6	39KΩ	0Ω	0Ω	.1Ω	↑ 2KΩ	↑ 2KΩ	0Ω	
V 3	6AU6	6.5Meg	0Ω	0Ω	.1Ω	↑ 3.5KΩ	↑ 3.5KΩ	33Ω	
V 4	6BA6	3.6Meg	0Ω	0Ω	.1Ω	↑ 7.8KΩ	↑ 7.8KΩ	100Ω	
V 5	6AL5	DEF	DEF	0Ω	.1Ω	0Ω	0Ω	20KΩ	
V 6	6AV6	10 Meg	0Ω	0Ω	.1Ω	520KΩ	0Ω	↑ 520KΩ	
V 7	6AQ5	470KΩ	270Ω	0Ω	.1Ω	↑ 410Ω	↑ 1KΩ	470KΩ	
V 8	6X5GT	DEF	.1Ω	160Ω	DEF	18MΩ	DEF	0Ω	100KΩ

* MEASURED IN FM POSITION
† MEASURED FROM PIN 8 OF V8.
MEASUREMENTS ARE IN AM POSITION UNLESS OTHERWISE SPECIFIED

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings
6. Volume control at maximum, no signal applied for voltage measurements

A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1954

239-10



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Allow a 15 minute warm up period for receiver and test equipment.
With tuning gang fully closed set dial pointer approximately 1/4 inch to the left of the index mark at "55" on the dial.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 1 (grid) of 6BA6 (V4). Low side to chassis.	455KC (400∿Mod)	AM	Tuning gang fully open	Across voice coil	A1, A2,	Adjust for maximum deflection.
2.	"	High side to pin 1 (grid) of 6AU6 (V3). Low side to chassis.	"	"	"	"	A3, A4	Adjust for maximum deflection. Repeat step 1.
3.	"	"	1620KC	"	"	"	A5	Adjust for maximum deflection.
4.	50MMF	High side to antenna terminal. Low side to chassis.	1400KC	"	Tune to 1400KC signal	"	A6	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
5.	.005MFD	High side to pin 1 (grid) of 6BA6 (V4). Low side to chassis.	10.7MC (Unmod)	FM	Tuning gang fully open	DC probe to point (A). Common to chassis.	A7	Attenuate generator output to maintain -3 volts at VTVM.
6.	"	"	"	"	"	DC probe to point (B). Common to point (C).	A8	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
7.	"	"	"	"	"	DC probe to point (A). Common to chassis.	A9	Attenuate generator output to maintain -3 volts at VTVM. Adjust for maximum deflection.
8.	"	"	"	"	"	"	A10, A11	Attenuate generator output to maintain -3 volts at VTVM. Adjust for maximum deflection. Retouch A9 and A7 for maximum deflection.
9.	"	"	"	"	"	DC probe to point (B). Common to point C.	A8	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
5.	.005MFD	High side to pin 5 (plate) of 6BJ6 (V1). Low side to chassis.	10.7MC (450KC Swp)	FM	Tuning gang fully open	Vert. Amp. to point (A). Low side to chassis.	A7, A9 A10, A11	Disconnect stabilizing capacitor C2. Adjust for curve of maximum amplitude and symmetry similar to Fig.1.
6.	"	"	"	"	"	"	A8	Reconnect stabilizing capacitor C2. Adjust so that 10.7MC occurs at center of crossover lines. SLIGHTLY retouch A7 for maximum amplitude and straightness of crossover lines. Continue alignment with step 10.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
10.	300Ω Carbon Resistor	Across FM antenna terminals (300Ω in hot lead).	92MC	FM	92MC	DC probe to point (A). Common to chassis.	A12	Attenuate generator output to maintain -3 volts at VTVM. Adjust for maximum deflection.
11.	"	"	"	"	"	"	A13	"

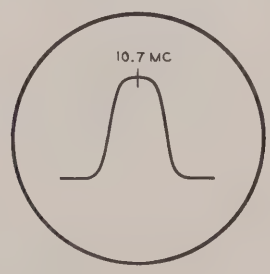


FIG. 1

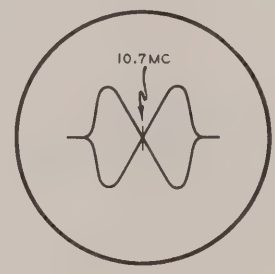


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		TRUETONE PART No.	STANDARD REPLACEMENT		
V1	FM RF Amplifier	6BJ6	6BJ6	7CM	
V2	FM Convertor-AM Oscillator	6CB6	6CB6	7CM	
V3	FM IF Amp.-AM Mixer	6AU6	6AU6	7BK	
V4	AM FM IF Amp.	6BA6	6BA6	7BK	
V5	Ratio Detector	6AL5	6AL5	6BT	
V6	AM Det-AVC-AF Amp.	6AV6	6AV6	7BT	
V7	Audio Output	6AQ5	6AQ5	7BZ	
V8	Rectifier	6X5GT	6X5GT	6S	

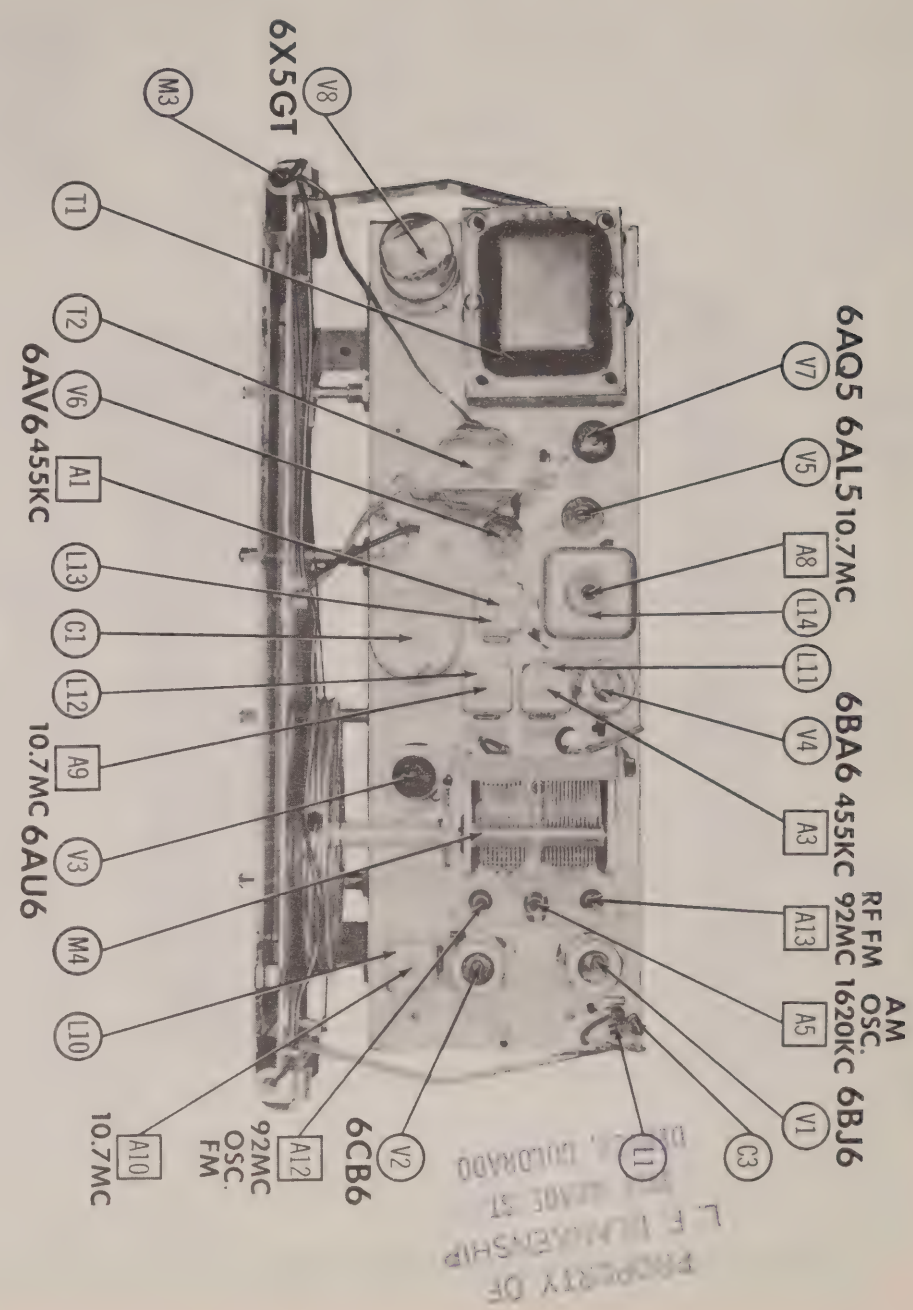
CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	TRUETONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	▬40	200	45X406	AFH3-100		C087		FP346	TVL-3813	
B	■40	200								
C	▲20	25								
C2	4	100	45X361	PRS150/4		BR415		TC40	TVA-1402	
C3	470		47X622	SI470	D6-471	TP46	GP2K-471	UC-5347	5GA-T47	
C4	470		47X622	SI470	D6-471	TP46	GP2K-471	UC-5347	5GA-T47	
C5	1000		80X1	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C6	1000		80X1	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C7	5000		47X507	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C8	5000		47X507	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C9	5000		47X507	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C10	15		47X617	SI15NP0	TCZ-15	TZ11	NP0K-150	ZT-5415	5TCC-Q15	
C11	33		47X619	SI33NP0	TCZ-33	TZ18	NP0K-330	ZT-5433	5TCC-Q33	
C12	9		47X616							
C13	33		47X619	SI33NP0	TCZ-33	TZ18	NP0K-330	ZT-5433	5TCC-Q33	
C14	56		47X625	SI56	D6-560	TP31	GP1K-560	UC-5456	5GA-Q56	
C15	33		47X619	SI33NP0	TCZ-33	TZ18	NP0K-330	ZT-5433	5TCC-Q33	
C16	15		47X618							
C17	5000		47X507	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C18	.01	200	RCP10W2103M	P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C19	220		47X621	SI220	D6-221	TP39	GP2K-221	UC-5322	5GA-T22	
C20	5000		47X507	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C21	1500		47X545	SI1500	D6-152	TP54	GP2L-152	UC-5215	5HK-D15	
C22	5000		47X507	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C23	.05	200	RCP10W2503M	P288-05	DF-503	CUB2S5		PT415	2TM-S5	
C24	5000		47X507	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C25	390	500	47X623	1469-0004		5R5T39		MCB243	MS-34	
C26	2700		47X575	SI2700	D6-272	TP59	GP2-333-272	UC-5227	5HK-D27	
C27	47		47X509	SI47	D6-470	TP29	GP1K-470	UC-5447	5GA-Q47	
C28	.02	200	RCP10W2203M	P288-02	DF-203	CUB2S2		PT412	2TM-S2	
C29	68	500	47X471	1479-00007		22R5Q68			MS-47	
C30	.005	200	RCP10W2502M	P688-005	D6-502	CUB6D5	GP2-333-502	PT625	6TM-D5	
C31	.01	200	RCP10W2103M	P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C32	5000		47X507	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C33A	.01		♦ 76X5	♦PA-112-3	♦PC-80	♦113TM1	♦1404-01		♦102C1	
B	250									
C										
C34	.005	800	RCP10W8502M	P1088-005	DD16-502	CUB16D5		PT1625	MB-D5	
C35	.1	400	RCP10W4104M	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C36	5000		47X507	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C37	5000		47X507	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	

♦ Items C33A, C33B, C33C, R25A, R25B are combined in one unit.
When replacing items separately, C33B and C33C should total 250MMF.

CHASSIS—TOP VIEW



PROPERTY OF L. F. DUMONT SHIP

PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	TRUETONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	1 Meg	½	40X351A	Q11-137	A47-1Meg-S	AB-69	U-54	Tone
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R1A
R2A	2 Meg	½	B36X389			ABT-81	UT-448	Volume tapped @ 240K
B	Shaft		Not Req.			AK-4	Not Req.	Attach to R2A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	TRUETONE PART No.	IRC PART No.	
R3	33KΩ	½	B85333	BTS-33K	
R4	2200Ω		B85222	BTS-2200	
R5	1000Ω		B85102	BTS-1000	
R6	39KΩ		B84393	BTS-39K	Note 1
R7	1000Ω		B85102	BTS-1000	
R8	39KΩ		B84393	BTS-39K	Note 2
R9	1000Ω		B85102	BTS-1000	
R10	4.7Meg		B85475	BTS-4.7Meg	
R11	33Ω		B84330	BTS-33	
R12	2200Ω		B84222	BTS-2200	
R13	10KΩ		B84103	BTS-10K	
R14	100Ω		B84101	BTS-100	
R15	6800Ω		B84682	BTS-6800	
R16	3.3Meg		B85335	BTS-3.3Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	TRUETONE PART No.	IRC PART No.	
R17	47KΩ	½	B85473	BTS-47K	
R18	470KΩ		B84474	BTS-470K	
R19	27KΩ		B85273	BTS-27K	
R20	10KΩ		B84103	BTS-10K	
R21	10KΩ		B84103	BTS-10K	
R22	2.2Meg		B85225	BTS-2.2Meg	
R23	68KΩ		B85683	BTS-68K	
R24	10 Meg		B85106	BTS-10 Meg	
R25A	470KΩ		♦ 76X5	BTS-470K	
B	470KΩ			BTS-470K	
R26	270KΩ		B84271	BTS-270K	
R27	47KΩ		B85473	BTS-47K	
R28	1000Ω	2	B85102	BTB-1000	

Note 1. Some models may use a 180KΩ resistor in this application.
Note 2. Not used in all models.
♦ Items R25A, R25B, C33A, C33B, C33C are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	TRUETONE PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC @ .29A	316VCT .047A	6.3VAC @ 3.3A		53X291G					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	TRUETONE PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T2	5.8KΩ	3.4Ω	51X162	A-3823	A-3019	S-5Z	H1002	T-26S48	

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	TRUETONE PART No.	JENSEN PART No.	QUAM PART No.	
SP1	6"	PM	3.4Ω	12A509	ST-108 Mod P6-X	6A21	

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	TRUETONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	FM Ant. Coil	0Ω		9A2305				
L2	Fil. Choke	0Ω		9A2304				. 2 Microhenry
L3	FM RF Coil	0Ω		9A2300				
L4	Fil. Choke	0Ω		9A2303				. 2 Microhenry
L5	Cathode Choke	0Ω		9A2306				. 02 Microhenry
L6	FM Osc. Coil	0Ω		9A2305				. 47 Microhenry; IRC Part # CLA
L7	RF Choke	.22Ω		35A9				
L8	AM Loop Ant.	0Ω	1.2Ω	9A2311				
L9	AM Osc. Coil	3Ω	6.5Ω	9A2302	14-1060		71-Osc	Sec. tapped @ 6Ω & @ 6.2Ω
L10	1st FM IF	1Ω	1Ω	9A2310	16-3487	FM-254	1463	
L11	1st AM IF	13Ω	16Ω	9A2308	16-6758	BC-352	12-C1	
L12	2nd FM IF	.4Ω	.4Ω	9A2309	16-3487	FM-254	1463	
L13	2nd AM IF	17Ω	17Ω	9A2307	16-6770	BC-355	12-C6	
L14	Ratio Det.	2.1Ω	.1ΩCT	9A2260	17-3487	FM-252	1453	Tertiary winding=.35Ω

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							REMARKS
	TRUETONE PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1	10L3-J	10L3-J	A-1 A-3			96-T	0-1 or S-1 and 0-3 or S-3	

ASTATIC AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENT SEE BELOW.

PHONO NEEDLE

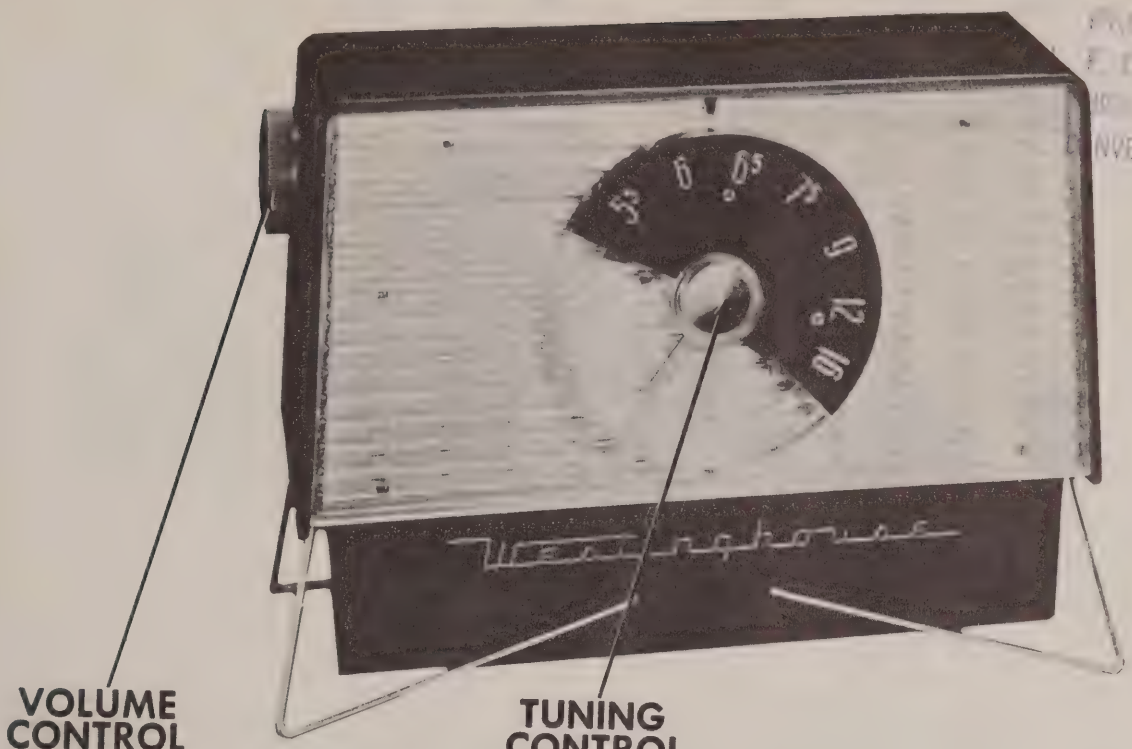
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	TRUETONE PART No.	WALCO PART No.	JENSEN PART No.	
M2	* A3-J ♦ A1-J	W-5A or W-5S W-5MGAorW-5MGS	A-75 or A-85 A-75LPorA-85LP	* For 78RPM records ♦ For 33-45RPM records

MISCELLANEOUS

ITEM No.	PART NAME	TRUETONE PART No.	NOTES
M3	Dial light	7A103	(2) # 47 bayonet
M4	Tuning cap	14A223-1	(23-447MMF)(10-130MMF)
M5	Switch	2A437	Function
A6	Trimmer cap	17A256	AM ant. (2-24MMF)
	Cabinet	454	Mahogany
	Cabinet	460	Oak
	Knob	10A759	(4) mahogany
	Knob	10A766	(4) beige
	Dial glass	58X774	

WESTINGHOUSE
MODELS H417T5, H418T5 (Ch. V2186-1)



WESTINGHOUSE
MODELS H417T5, H418T5 (Ch. V2186-1)

TRADE NAME	Westinghouse Models H-417T5, H418T5 (Ch. V-2186-1)
MANUFACTURER	Westinghouse Electric Corp., TV-RAdio Div., Metuchen, N.J.
TYPE SET	AC-DC Operated AM Superheterodyne Receiver
TUBES (Five)	Types 12BE6 Converter, 12BA6 IF Amp., 12AV6 Det.-AVC-AF Amp., 50C5 Audio Output, 35W4 Rectifier
POWER SUPPLY	105-120 Volts AC-DC
TUNING RANGE—BROADCAST	540-1600KC

RATING .23 Amp. @ 117 Volts AC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Use battery power, if possible. If AC power is used, use an isolation transformer when available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	200MMF	High side to antenna stator lug on tuning gang. Low side to B-.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum deflection.
2.	"	"	1625KC	"	"	A5	"
3.		Loop	1400KC	Tune to 1400KC signal	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1954 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		WESTINGHOUSE PART No.	STANDARD REPLACEMENT		
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amplifier	12BA6	12BA6	7BK	
V3	Det-AVC-AF Amp.	12AV6	12AV6	7BT	
V4	Audio Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	Westinghouse PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	50	150	V-12287-1	PRS150/50-50		BBRD-5515		2N521	TVA-2453	Red
B	50	150								Orange
C2	10000		R2CC63Z5Z103P	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C3	2000		R2CC63Z5Z202P	BPD-002	DD-202	K072	801-002	DC-522	5HK-D2	
C4A	220									
B	5000									
C	250		♦V-10789-2	♦PA-113-2	♦PC-151	♦1116TM2	♦1408-02		♦103C5	
D										
E	5000									
C5	.02	600		P688-02	DF-203	CUB6S2		PT612	6TM-S2	Note 1
C6	.047	400	V-10157-4473M	489ZX-047		PJ4S47		PT4147	4TM-S47	
C7	.05	400	RCP10W4503M	P488-05	DF-503	CUB4S5		PT415	4TM-S5	

♦ Items C4A, C4B, C4C, C4D, C4E, R5A, R5B and R5C are combined in one unit.
When replacing items separately items C4C and C4D should total 250MMF.
Note 1. Some may use an .01MFD @ 600V in this application.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Westinghouse PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	½	V9993-1	Q13-133	A47-500K-Z	BSK-60-S	U-48	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWE-12	Not Req.	US-26	Attach to R1A

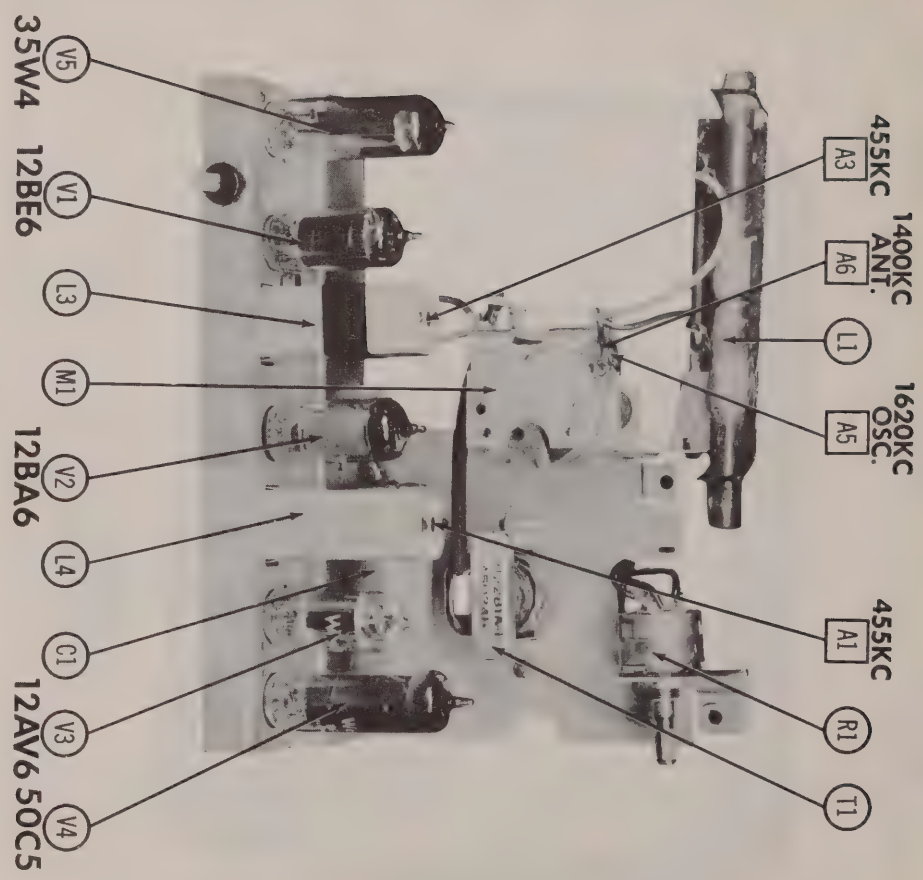
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Westinghouse PART No.	IRC PART No.	
R2	22KΩ	½	RC20AE223M	BTS-22K	
R3	3.3Meg	½	RC20AE335M	BTS-3.3Meg	
R4	680Ω	½	RC20AE681M	BTS-680	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Westinghouse PART No.	IRC PART No.	
R5A	6.8Meg	½	♦V-10789-2	BTS-6.8Meg	
B	470KΩ	½		BTS-470K	
C	470KΩ	½		BTS-470K	
R6	150Ω	½	RC20AE151M	BTS-150	
R7	1500Ω	1	RC30AE152M	BTS-1500	

♦ Items R5A, R5B, R5C, C4A, C4B, C4C, C4D, C4E are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Westinghouse PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T1	2.1KΩ	3.6Ω	V-12281A-1	A-3332	A-3025	S-1X①	Z1101	TS-24S50①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	Westinghouse PART No.	VIKING PART No.	QUAM PART No.	
SP1	3½"	PM	3.6Ω	V-11924-1	35J4	3A07	

COILS (RF-IF)

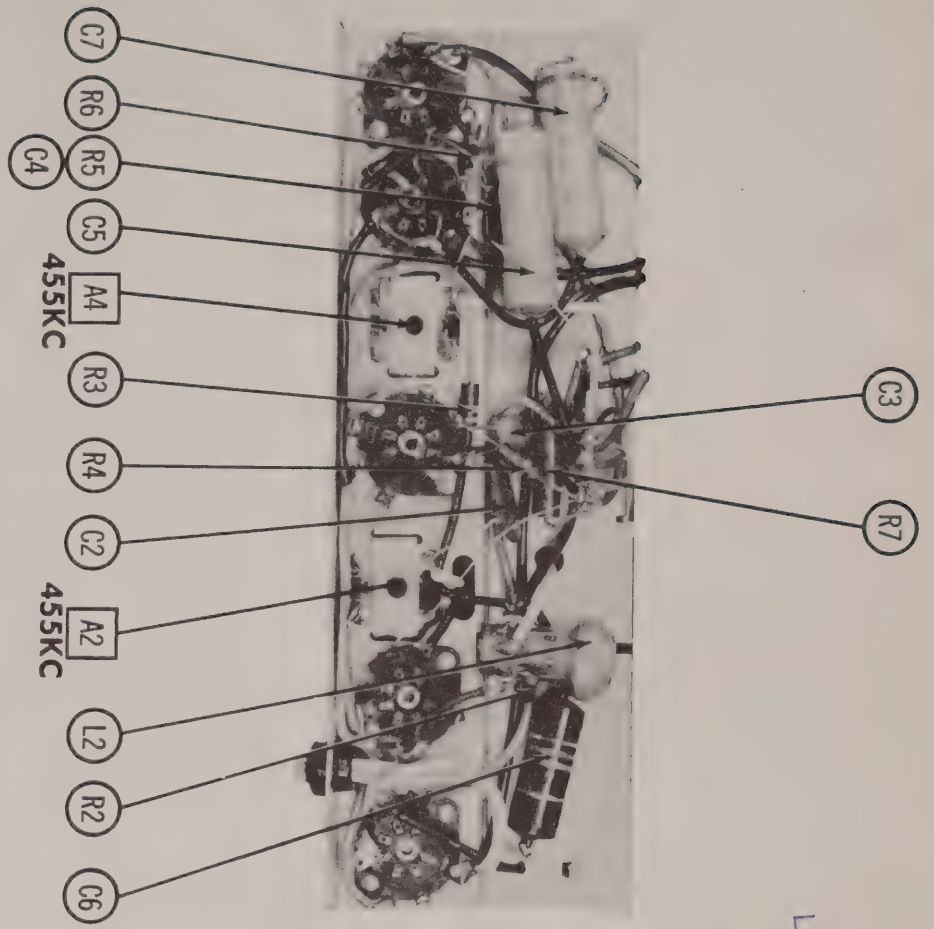
ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	Westinghouse PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	.8Ω		V-12282-1				
L2	Osc. Coil	1Ω	12Ω	V-12283-1	14-1073		69-Osc. †	
L3	Input IF	17Ω	17Ω	V-10945-1	16-6758	BC-352	12-C1	
L4	Output IF	17Ω	17Ω	V-10945-1	16-6758	BC-353	12-C2	

† Drill mounting hole.

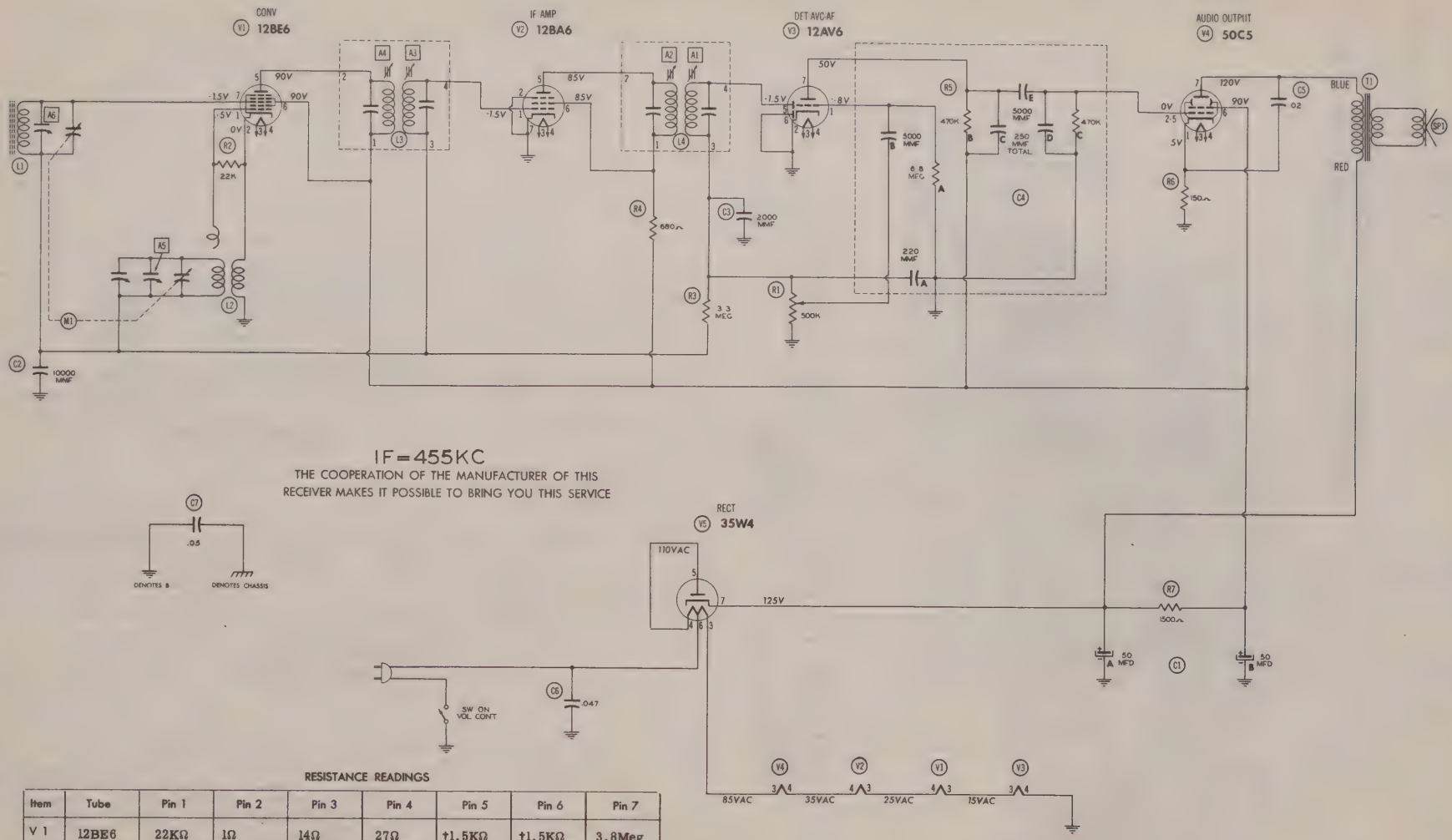
MISCELLANEOUS

ITEM No.	PART NAME	Westinghouse PART No.	NOTES
M1	Tuning cap	V-12291-1	2 section (23-225MMF) (16-115MMF)
	Cabinet	V-1328-1	H-417T5
	Cabinet	V-1328-2	H-418T5
	Knob	V-12297-1	Volume H-417T5
	Knob	V-12297-1	Volume H-418T5
	Dial	V-12296-1	Assembly H-417T5
	Dial	V-12296-2	Assembly H-418T5

CHASSIS—BOTTOM VIEW



PROPERTY OF
L. F. BLANKENSHIP
3974 MIAME ST
DENVER, COLORADO



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	1Ω	14Ω	27Ω	†1.5KΩ	†1.5KΩ	3.8Meg
V 2	12BA6	3.8Meg	0Ω	27Ω	38Ω	†2.2KΩ	†2.2KΩ	0Ω
V 3	12AV6	6.8Meg	0Ω	14Ω	0Ω	500KΩ	0Ω	†470KΩ
V 4	50C5	150Ω	470KΩ	90Ω	38Ω	470KΩ	†1.5KΩ	†200Ω
V 5	35W4	0Ω	INF	90Ω	125Ω	125Ω	118Ω	500KΩ

† MEASURED FROM PIN 7 OF V5

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1954

PHOTOFACT* Folder

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST
DENVER, COLORADO

IMPORTANT FILING NOTICE

The contents for this envelope will be found among the last folders in this complete set of folders . . . *unless* it has been purchased as part of a *complete* volume of PHOTOFACTS assembled in a DeLuxe Binder.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

MODEL L2287RU

ZENITH MODELS L2259E, EU, R, RU, L2260R, RU, L2261E, EU, H, HU, L2266R, RU, L2267E, EU, H, HU, L2270, U, (Ch. 21L21), L2287R, RU (Ch. 21L21 & Radio Ch. 10L20)

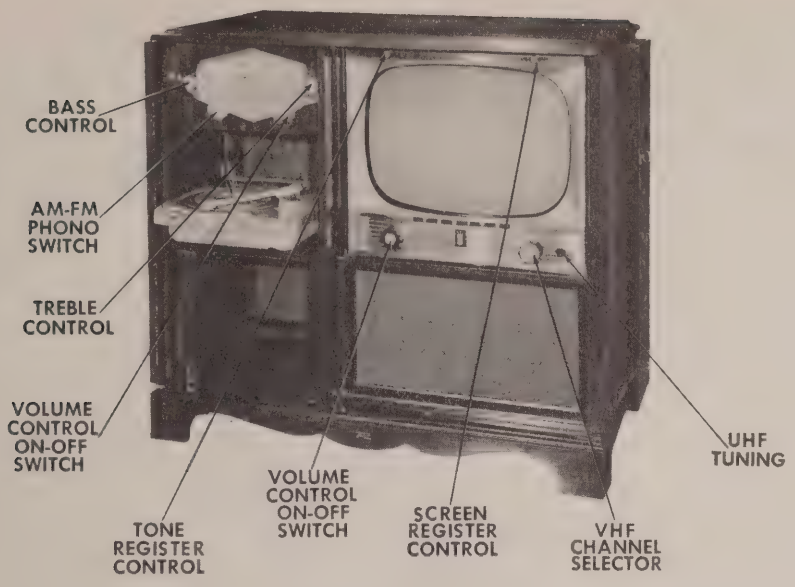
HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1954 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." -Printed in U. S. of America

DATE 5-54 SET 239 FOLDER 12

PROPERTY OF
L. F. BLANKENSHIP
[illegible] MEADE ST
DENVER, COLORADO

ZENITH MODELS L2259E, EU, R, RU, L2260R, RU, L2261E, EU, H, HU, L2266R, RU, L2267E, EU, H, HU, L2270, U, (Ch. 21L21), L2287R, RU (Ch. 21L21 & Radio Ch. 10L20)



ZENITH MODEL L2287RU

TRADE NAME	Zenith	MODELS	CHASSIS
		L2259E, EU, R, RU, L2260R, RU, L2261E, EU, H, HU, L2266R, RU, L2267E, EU, H, HU, L2270, U	21L21
		L2287R, RU	21L21 & Radio Ch. 10L20
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago 39, Ill.		
TYPE SET	TV-AM-FM-Phono Combination Receiver		
TUBES	Twenty-four (TV only)		
POWER SUPPLY	110-120 Volts AC-60 Cycle	RATING	2 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83UUHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

INDEX

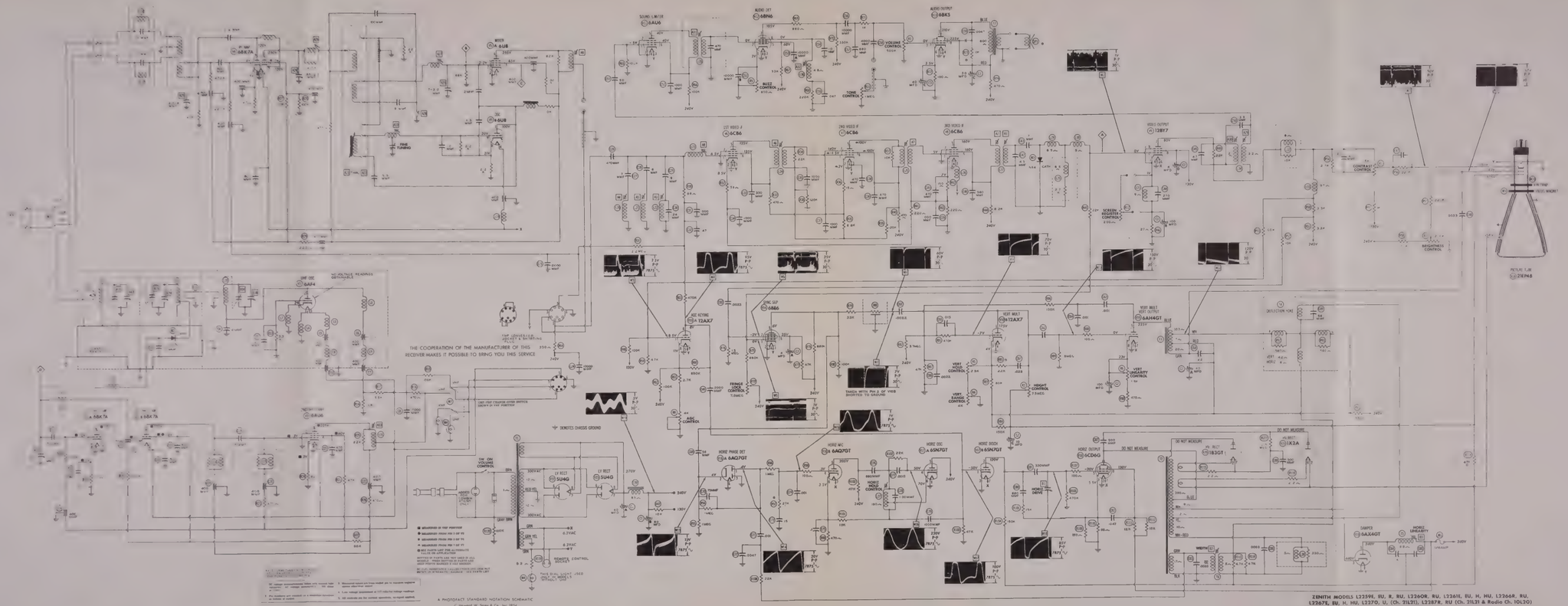
Alignment Instructions 6, 7
Drive Cord Stringing 21
Disassembly Instructions 11
Horizontal Sweep Circuit Adjustments 11
Parts List and Descriptions ..... 15 thru 18
Photographs
Cabinet-Rear View 11
Capacitor Identification 4, 9
Chassis-Top View 3
RF Tuner 10
Resistor Identification 13, 20
Photographs (Cont)
Trans., Inductor & Alignment Identification..... 23
Resistance Measurements 8
Servicing in the Field 22
Schematic (Radio) 14, 19
Schematic (TV) 2
Trouble Shooting Aids 12, 21
Tube Failure Check Chart 5
Tube Placement Chart (Bottom View) 8
Tube Placement Chart (Top View) 5

FOR SERVICE INFORMATION ON RECORD CHANGER, SEE ZENITH MODEL S-14054, PHOTOFACT SET 226, FOLDER 14.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1954 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO



THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

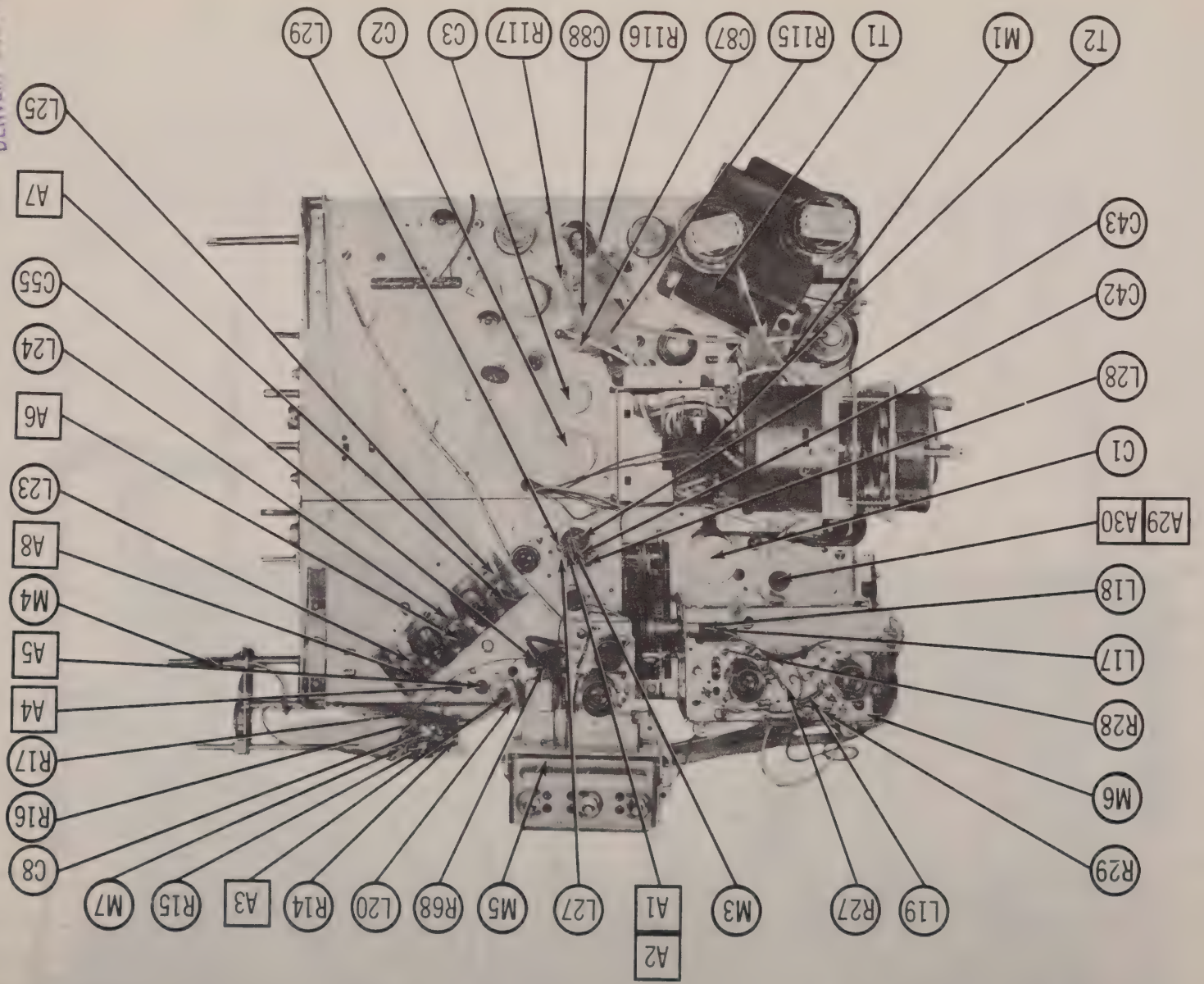
Copyright © Howard W. Sams & Co., Inc. 1954

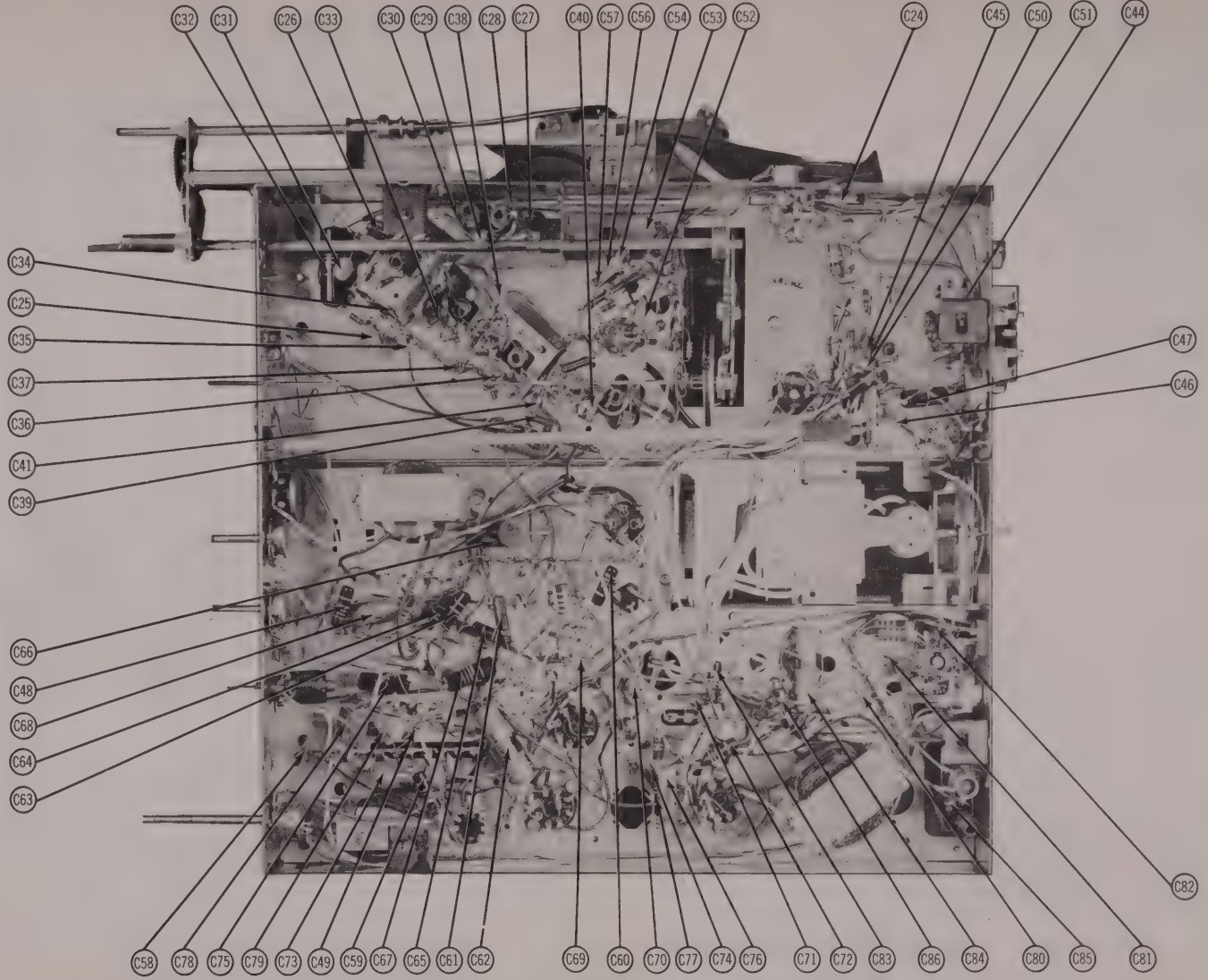
ZENITH MODELS L2259E, EU, R, RU, L2260R, RU, L2261E, EU, H, HU, L2266R, RU, L2267E, EU, H, HU, L2270, U, (Ch. 21L21), L2287R, RU (Ch. 21L21 & Radio Ch. 10L20)

ZENITH MODELS L2259E, EU, R, RU, L2260R, RU, L2261E, EU, H, HU, L2266R, RU, L2267E, EU, H, HU, L2270, U, (Ch. 21L21), L2287R, RU (Ch. 21L21 & Radio Ch. 10L20)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

CHASSIS TOP VIEW



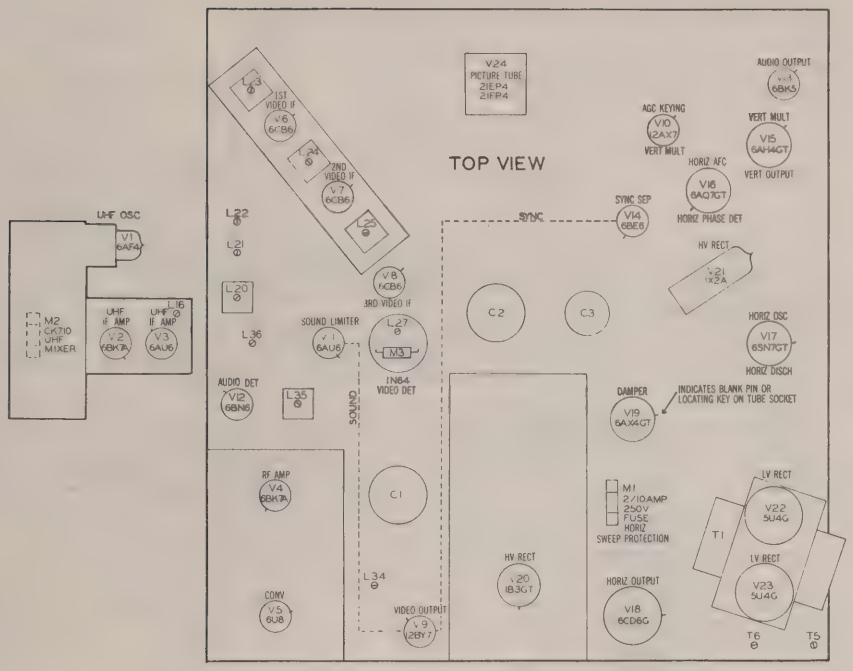


PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

TUBE PLACEMENT CHART

PROPERTY OF
L.F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V22, V23

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V5, V6, V7, V8, V9, (V1, V2, V3 UHF only)
No pic, no sound, has snow - V4, V5, V6
No pic, has sound, has raster - V9, V24
Has pic, no sound - V11, V12, V13
Overloaded picture - V10

SYNC FAILURE
No vert. sync - V10, V14, V15
No horiz. sync - V14, V16, V17
No vert. or horiz. sync - V14

SWEEP FAILURE
No raster, has sound - V17, V18, V19, V20, V21, V24, Fuse (M1)
No vertical deflection - V10, V15
Poor vert. linearity or foldover - V10, V15
Poor horiz. linearity or foldover - V17, V18, V19
Narrow picture - V17, V18, V19, V20, V21, V22, V23
Vert. off freq. - V10, V14, V15
Horiz. off freq. - V14, V16, V17

ZENITH MODELS L2259E, EU, R, RU, L2260R, RU, L2261E, EU, H, HU, L2266R, RU, L2267E, EU, H, HU, L2270, U, (Ch. 21L21), L2287R, RU (Ch. 21L21 & Radio Ch. 10L20)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube to disable the high voltage.

VIDEO IF ALIGNMENT

Connect the negative lead of a 2 volt battery to the ungrounded side of C31. Connect the positive lead to chassis. Use very short leads.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	470MMF	High side to pin 1 (grid) of 6CB6 (V8). Low side to chassis.	44MC (10MC Swp)	41.25MC 45.75MC	Any non-interfering channel	Vert. Amp. thru 10KΩ to point (A). Low side to chassis.	A1, A2	Attenuate generator for 3 volts peak to peak on scope. Adjust for curve of maximum amplitude and symmetry similar to Fig.1.
2.	"	High side to point (B). Low side to chassis.	"	39.75MC 41.25MC 47.25MC	"	"	A3 A4 A5	Remove the bias battery and set scope gain to amplify the trap region of the response curve as in Fig. 2. Adjust for MINIMUM marker amplitude. Replace bias battery.
3.	"	"	"	42.75MC 45.0MC 45.75MC	"	"	A6, A7, A8, A9	Alternately adjust A6 thru A9 for response similar to Fig.3. A6 affects the low side and A7 the high side of the response curve. If proper response cannot be obtained, SLIGHTLY retouch A1 and A2.

OSCILLATOR ALIGNMENT

The master oscillator adjustment of A10 is to be made only if the individual channel oscillator adjustment fails to bring the channels within the range of the fine tuning control. If channels 2 through 6 fall within the range of the fine tuning control but the higher channels do not, slight adjustment of A10 may be necessary to bring the higher channels in.
Connect the negative lead of the bias supply to the ungrounded side of C31. Connect positive lead to chassis. Adjust for -1 volt at C31.
Turn up the scope gain so that the sound trap notch in the response curve becomes visible.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	57MC (10MC Swp)	59.75MC	2	Vert. Amp. thru 10KΩ to point (A). Low side to chassis.	A11	Adjust to place sound marker in trap notch as in Fig. 4.
			63MC (10MC Swp)	65.75MC	3		A12	
			69MC (10MC Swp)	71.75MC	4		A13	
			79MC (10MC Swp)	81.75MC	5		A14	
			85MC (10MC Swp)	87.75MC	6		A15	
			177MC (10MC Swp)	179.75MC	7		A16	
			183MC (10MC Swp)	185.75MC	8		A17	
			189MC (10MC Swp)	191.75MC	9		A18	
			195MC (10MC Swp)	197.75MC	10		A19	
			201MC (10MC Swp)	203.75MC	11		A20	
			207MC (10MC Swp)	209.75MC	12		A21	
			213MC (10MC Swp)	215.75MC	13		A22	

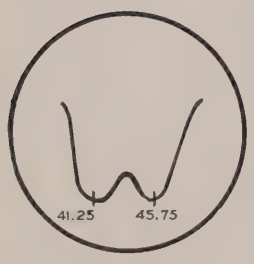
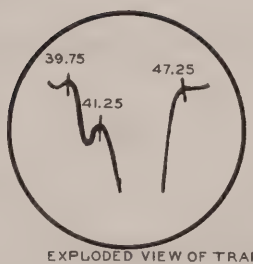


FIG. 1



EXPLODED VIEW OF TRAPS
FIG. 2

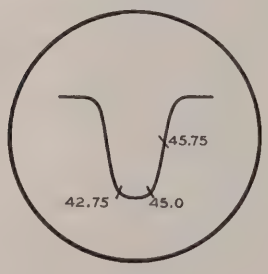


FIG. 3

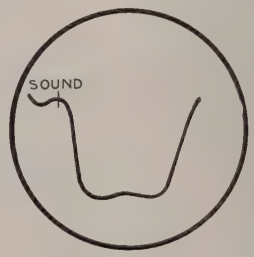


FIG. 4

ALIGNMENT INSTRUCTIONS (cont)

PROPERTY OF
L. F. BLANKENSHIP
3926 MEADE ST.
DENVER, COLORADO

RF AND MIXER ALIGNMENT

Remove bias battery from C31 and connect a jumper from the turret AGC (yellow) lead to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	69MC (10MC Swp)	67.25MC 69.75MC	4	Vert. Amp. thru 10KΩ to point Ⓒ. (Accessible on top of tuner). Low side to chassis.	A23, A24 A25	Adjust for response similar to Fig. 5.
6.	"	"	201MC (10MC Swp)	199.25MC 203.75MC	11	"	A26, A27, A28	Adjust A26 and A27 for symmetrical response similar to Fig. 6. Adjust A28 for proper band width. Remove jumper from tuner AGC terminal to chassis.

SOUND IF ALIGNMENT

Connect an attenuator (Zenith Part # S-17203 or equivalent) in series with the receiver antenna.
Tune in a tone modulated TV signal and adjust the attenuator until the signal falls below the limiting level of the 6BN6 limiter detector, as evidenced by a hiss similar to superregeneration.
Adjust the sound take-off transformer (A29 and A30), the sound IF transformer (A31) and the quadrature coil (A32) for maximum sound of best quality.
Adjust the buzz control (R9) for minimum intercarrier buzz.
If the intercarrier buzz cannot be eliminated with the buzz control check the setting of the AGC delay adjustment.
If during the sound IF alignment the signal rises above the limiting level (hiss disappears) increase the attenuation until the hiss returns.

UHF TUNER ALIGNMENT

Alignment of the UHF tiner should not be attempted in the field unless proper test equipment is available. If a UHF marker is not available it is possible to use another TV receiver equipped with an S-19670 tuner known to be calibrated. Couple the two tuners loosely (operate them close together) to inject a marker. This method furnishes a marker source for all channels above 22. To obtain a marker for channel 22 set the signal source tuner to channel 14. Always subtract 8 channels for the oscillator frequency required. To obtain a channel 83 marker, set the source receiver to channel 75.
Switch receiver to UHF position.
Connect the negative lead of a 2 volt bias supply to the ungrounded side of C31. Connect positive lead to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	470MMF	High side to point Ⓓ. Low side to chassis.	44MC (10MC Swp)	42.75MC 45.0MC 45.75MC	Any non-interfering UHF channel	Vert. Amp. thru 10KΩ to point Ⓐ. Low side to chassis.	A33	Adjust to obtain overall IF response curve similar to Fig. 3. Attenuate generator output to maintain 3 volts peak to peak on scope.
8.	Fig. 8	Across UHF antenna terminals thru matching network (Fig. 8)	713MC (20MC Swp)	711.25MC	54	"	A34	Tuner rocker arm should be in the horizontal position. If necessary, loosen set screw and adjust tuner shaft so that rocker arm is horizontal with indicator set to channel 54. Do not adjust A34 unless oscillator calibration is off more than three channels. If necessary, adjust A34 for response similar to Fig. 7 with video marker at 50%. The image (weaker response) will appear, also. The response towards the counter clockwise position of A34 is the proper response.
9.	"	"	"	"	"	"	A35 A36 A37	Adjust for maximum amplitude and symmetrical response similar to Fig. 7.
10.	"	"	473MC (20MC Swp)	471.25MC	14	"		Check for response similar to Fig. 7. If oscillator is off more than 3 channels, adjust the oscillator travel (osc., mixer and ant. travel adjustments are the three round thumb screws on top of tuner) adjustment to scale. Care must be used in making this adjustment so as not to move the rocker arm out of its bearing. Set the mixer and antenna travel adjustments for maximum response on scope.
11.	"	"	887MC (20MC Swp)	885.25MC	83	"	A38 A39 A40	Adjust A38 to place marker at 50% as in Fig. 7. Adjust A39 and A40 for maximum amplitude and symmetrical response.
12.	Check calibration on channels 14, 54 and 83. If necessary, repeat steps 8, 9, 10 and 11.							

FIG. 5

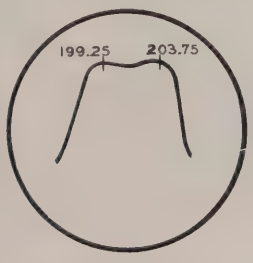


FIG. 6

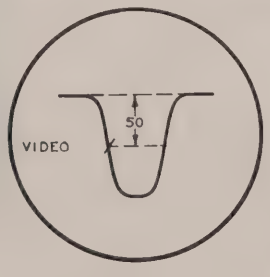


FIG. 7

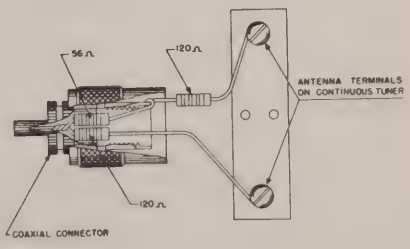


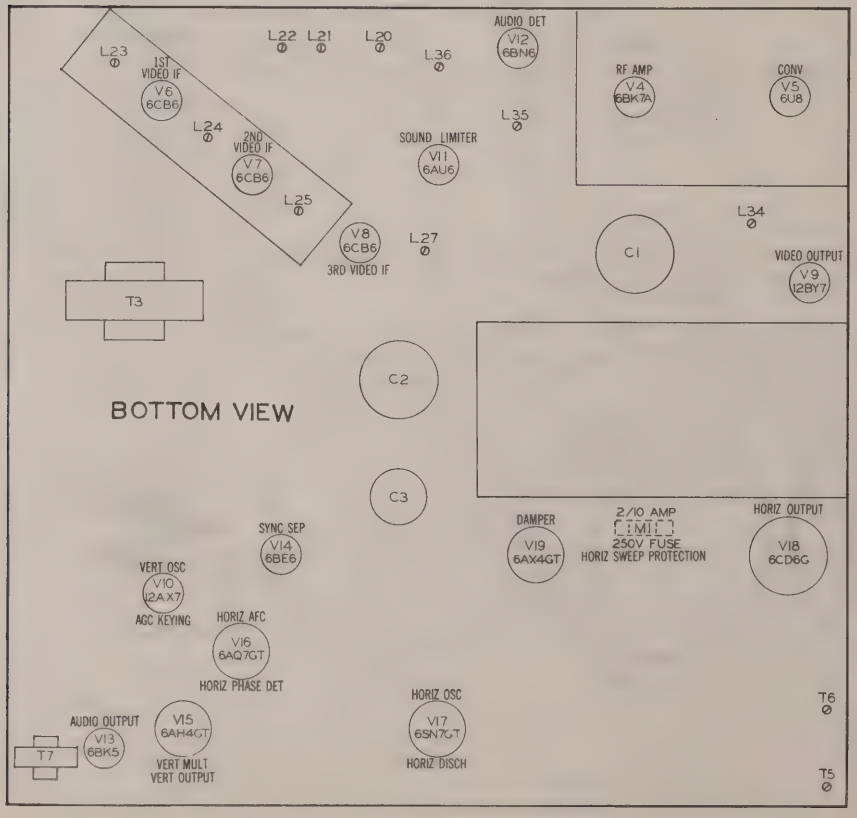
FIG. 8

ZENITH MODELS L2259E, EU, R, RU, L2260R, RU, L2261E, EU, H, HU, L2266R, RU, L2267E, EU, H, HU, L2270, U, (Ch. 21L21), L2287R, RU (Ch. 21L21 & Radio Ch. 10L20)

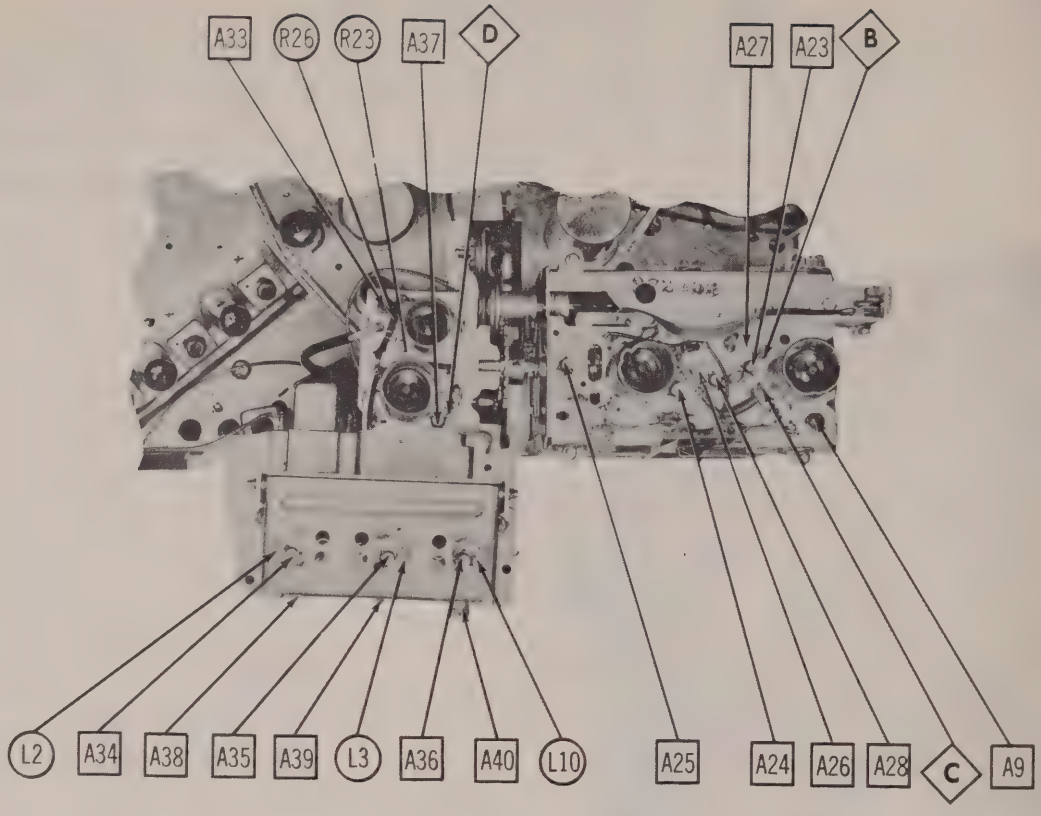
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AF4	†■5.8KΩ	3.3KΩ	.1Ω	0Ω	0Ω	3.3KΩ	†■5.8KΩ		
V 2	6BK7A	†■900Ω	†■69KΩ	INF	.1Ω	0Ω	INF	3.3Meg	47Ω	0Ω
V 3	6AU6	3.1Meg	0Ω	.1Ω	0Ω	†410Ω	115KΩ	82Ω		
V 4	6BK7A	†900Ω	†70KΩ	INF	.1Ω	0Ω	INF	3.3Meg	47Ω	0Ω
V 5	6U8	†10.5KΩ	68KΩ	†100KΩ	.1Ω	0Ω	†410Ω	0Ω	2.2KΩ	4.4KΩ
V 6	6CB6	1.4Meg	500Ω	.1Ω	0Ω	†90KΩ	†90KΩ	0Ω		
V 7	6CB6	†83KΩ	†90KΩ	.1Ω	0Ω	†550Ω	†550Ω	†90KΩ		
V 8	6CB6	220Ω	370Ω	.1Ω	0Ω	†8.3KΩ	†8.3KΩ	0Ω		
V 9	12BY7	30Ω	2.7KΩ	30Ω	0Ω	0Ω	.1Ω	†6.6KΩ	†10KΩ	30Ω
V 10	12AX7	▲3.3Meg	520KΩ	3KΩ	0Ω	0Ω	685KΩ	4.7KΩ	5KΩ	.1Ω
V 11	6AU6	100KΩ	0Ω	.1Ω	0Ω	†100KΩ	†100KΩ	0Ω		
V 12	6BN6	330Ω	.3Ω	.1Ω	0Ω	†33KΩ	220KΩ	†330KΩ		
V 13	6BK5	†1.1KΩ	INF	500KΩ	.1Ω	0Ω	100Ω	500KΩ	†550Ω	INF
V 14	6BE6	22KΩ	0Ω	.1Ω	0Ω	†680KΩ	†47KΩ	1.5Meg		
V 15	6AH4GT	1.8Meg	.1Ω	1.8Meg	INF	†700Ω	INF	0Ω	1.1KΩ	
V 16	6AQ7GT	2Meg	1Meg	0Ω	3Meg	†47KΩ	470Ω	.1Ω	0Ω	
V 17	6SN7GT	47KΩ	▲150KΩ	0Ω	32.5KΩ	†47KΩ	10.5KΩ	.1Ω	0Ω	
V 18	6CD6G	INF	0Ω	46Ω	INF	470KΩ	470KΩ	.1Ω	†6.7KΩ	TOP CAP ▲9Ω
V 19	6AX4GT	▲12Ω	1.5Ω	220KΩ	INF	†95Ω	INF	.1Ω	0Ω	
V 20	1X2A		PINS	1 - 8	HAVE	INF	RESISTANCE			TOP CAP ▲400
V 21	1X2A		PINS	1 - 8	HAVE	INF	RESISTANCE			TOP CAP ▲INF
V 22	5U4G	INF	16KΩ	INF	12Ω	INF	12Ω	INF	16KΩ	
V 23	5U4G	INF	16KΩ	INF	12Ω	INF	12Ω	INF	16KΩ	
V 24	21EP4B	0Ω	†300KΩ	PIN 10 ▲33KΩ	PIN 11 †250KΩ	PIN 12 .1Ω				

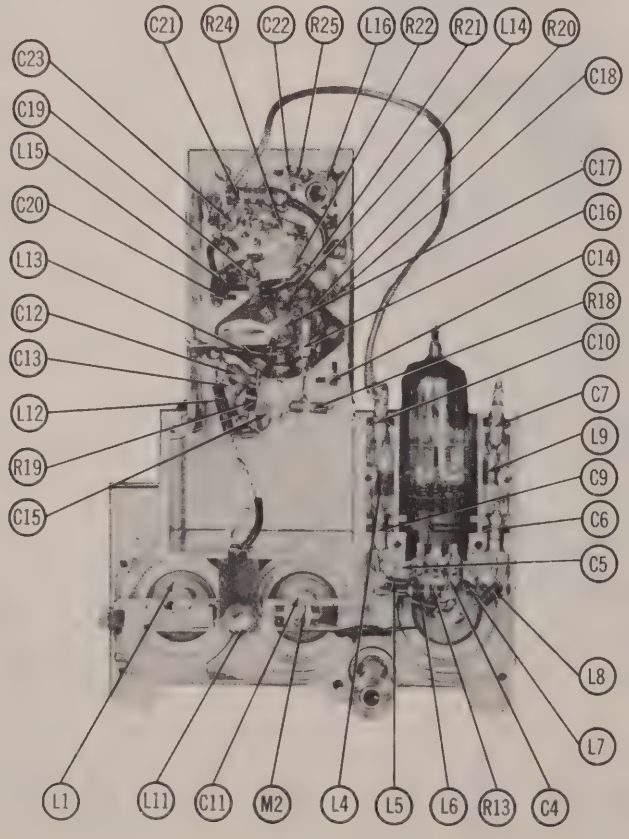
■ MEASURED IN UHF POSITION
† MEASURED FROM PIN 2 OF V23
▲ MEASURED FROM PIN 3 OF V19



TUBE PLACEMENT CHART

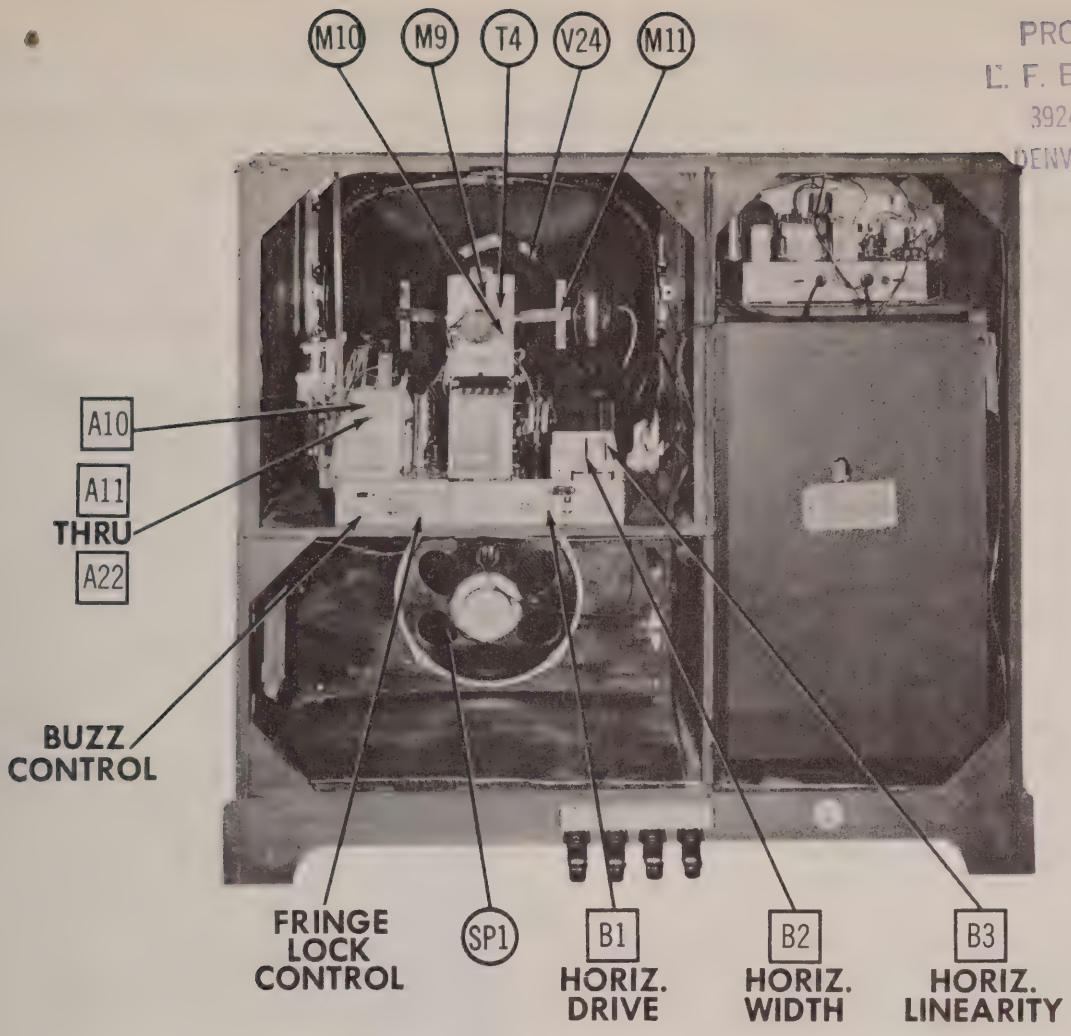


UHF-VHF TUNER-TOP VIEW



UHF TUNER-BOTTOM VIEW

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST
DENVER, COLORADO



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Set the horizontal hold adjustment until the picture synchronizes horizontally.

Adjust the horizontal drive trimmer (B1) for greatest picture width.

Adjust the width slug (B2) for a picture slightly wider than necessary to fill the picture mask horizontally.

Adjust the horizontal linearity slug (B3) for a picture that is symmetrical from left to right.

AGC DELAY CONTROL ADJUSTMENT

Connect the vertical amplifier of an oscilloscope thru a 10KΩ resistor to point (A). Low side to chassis. Select the strongest TV signal available and adjust the delay control for 2.5 volts peak output.

An alternate method of adjusting the AGC delay control can be made by observing the picture. Starting from full clockwise position turn AGC delay control slowly counter clockwise until picture distorts and buzz is heard in the sound. Turn control clockwise for clearest picture and best sound.

DISASSEMBLY INSTRUCTIONS

TV

Remove 10 push on type control knobs from front panel.

Remove 1 set screw. Remove 1 control knob.

Remove 6 wood screws. Remove rear cover.

Disconnect speaker leads, tone register plug , screen register plug and built-in antenna.

Remove 4 chassis bolt and 2 wood screws. Remove chassis.

Remove 4 speaker nuts. Remove speaker.

RADIO

Remove 5 push on type control knobs from front panel.

Disconnect FM antenna, AM antenna, phono motor, phono arm plug, speaker leads, bass and treble plug and AC line plug.

Remove 4 chassis bolts. Remove chassis.

Remove 2 nuts from bass and treble control.

Remove ground lead to treble control.

Remove controls.

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V17, V18, V19, V22 and V23. Check adjustments B1, B2 and B3. Check waveform W18.

If Satisfactory	If Unsatisfactory
Check T2, T4A, C82, C83, C84, C85, R109, R110, R111, R112, C86 and other associated circuit components.	Check C79, C80, C81, R103, R104, R106 and other associated components.

DRIVE LINES

Check adjustment B1. Check by substitution V17, V18 and V19. Check T2, T4A, C80, C81, C85, C89, C84, C85, L38 and other associated components.

COMPRESSED AT LEFT SIDE

Check by substitution V17, V18 and V19. Check adjustments B1, B2 and B3. Check components associated with the horizontal output and damper circuit components especially T2 and T4A.

FOLDS

Follow procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Check by substitution V17, V18 and V19. Check T2, T4A, L38, T5, T6 and other associated components for high voltage "arc-over".

XMAS TREE EFFECT

Check by substitution V16 and V17. Check components associated with these stages especially C76, C77, C78, C79 and L37.

VERTICAL

LOSS OF SWEEP

Check by substitution V10 and V15. Check waveform W10.

If Satisfactory	If Unsatisfactory
Check T3, T4B, R90 and other associated components.	Check R89, C62 and other associated components.

INSUFFICIENT SWEEP

Check adjustment of height and vertical linearity controls. Proceed as outlined under " Loss of Swee p".

COMPRESSED AT BOTTOM

Check by substitution V10 and V15. Check T3, T4B, C2B, and other associated components.

COMPRESSED AT TOP

Check by substitution V10 and V15. Check C62, C63, C64, C67, R89, R85 and other associated circuit components.

FOLDS

Check by substitution V10 and V15. Check components associated with V10B and V15 for failure or change of value.

SYNC

LOSS OF VERTICAL AND HORIZONTAL SYNC

Substitute V14. Check adjustment of the fringe lock control. Check associated components especially C60, R78, R80, and R76.

LOSS OF VERTICAL SYNC-HORIZONTAL SYNC SATISFACTORY

Check by substitution V10 and V14. Check wavef orm W7.

If Satisfactory	If Unsatisfactory
Check components associated with V10B.	Check vertical integrator and other associated components.

LOSS OF HORIZONTAL SYNC-VERTICAL SYNC SATISFACTORY

Check by substitution V16 and V17. Check components associated with these stages especially C76, C77, C78 and L37.

HORIZONTAL BENDING

Check by substitution V16, V17 and V18. Check horizontal AFC filter network. for component failure or change of value.

VIDEO

LOSS OF VIDEO

Substitute V9. Check C47, R56, contrast control, and other associated circuit components.

SOUND BARS (4. 5MC Beat)

Adjust tuner fine tuning for best picture and sound. Check adjustments A29 and A 30. Check video IF alignment.

POOR CONTRAST

Substitute V9. Check video detector crystal and assembly. Check contrast control, picture tube and other associated circuit components.

NEGATIVE PICTURE

Check by substitution V9 and V10. Check video detector assembly. Check V4, V6, V7 and V8. Check AGC network for component failure. Check picture tube.

SMEAR

Check V6, V7, V8 and V9 by substitution. Check video detector assembly. Check peaking coils, plate load resistors and coupling capacitors associated with V9.

WIDE BLACK BAR ACROSS PICTURE

Check V4, V5, V6, V7, V8 and V9 for heater to cathode leakage. In case of UHF check V1, V2 and V3.

AUDIO

WEAK OR NO SOUND

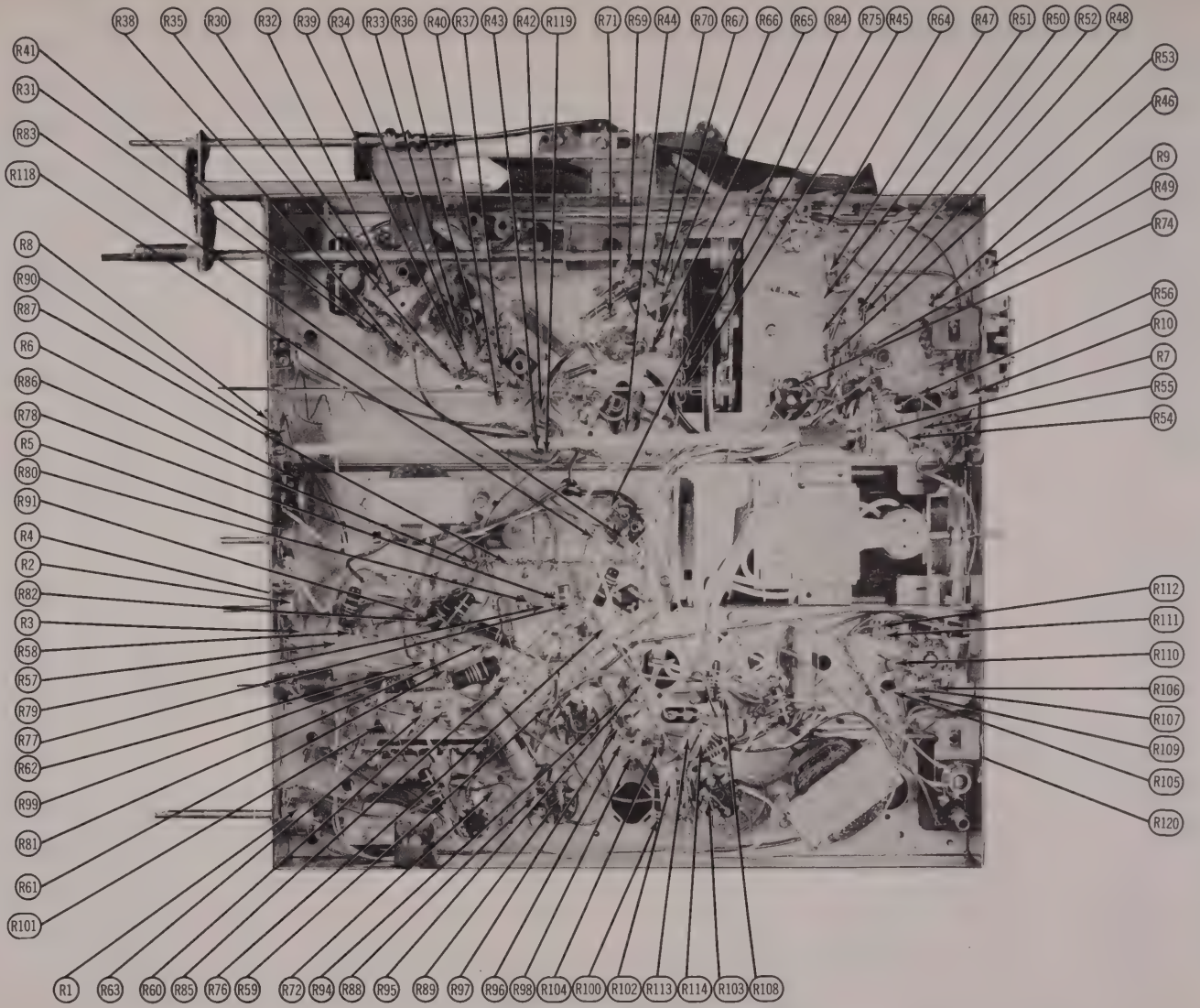
Check by substitution V11, V12 and V13. Check alignment of the Sound detector. Check components associated with V12 and V13.

BUZZ

Check adjustment of the buzz control . If still unsatisfactory, substitute V12 and realign audio IF and detector stages.

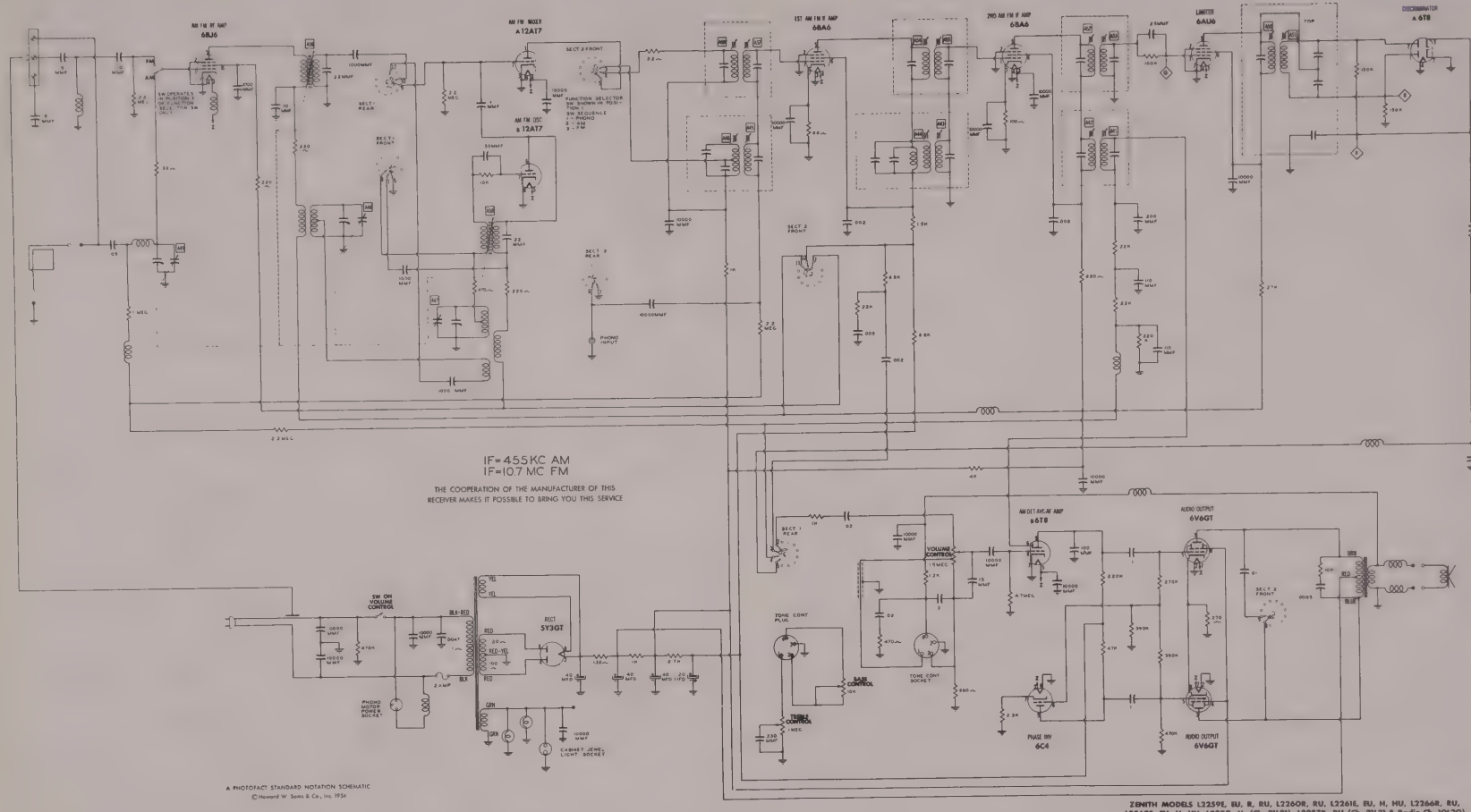
DISTORTED

Check by substitution V11, V12 and V13. Check audio IF and detector alignment. Check components associated with V11, V12 and V13. for failure or change of value.



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PROPERTY OF
L. F. BLANKENS
3924 MEADE ST.
DENVER, COLORADO


IF=4.55KC AM
IF=10.7 MC FM
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1954
ZENITH MODELS L2259E, EU, R, RU, L2260R, RU, L2261E, EU, H, HU, L2266R, RU, L2267E, EU, H, HU, L2270, U, (Ch. 21L21), L2287R, RU (Ch. 21L21 & Radio Ch. 10L20)

RADIO SCHEMATIC

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	UHF Oscillator	6AF4	6AF4	7DK	
V2	UHF IF Amp.	6BK7A	6BK7A	9AJ	
V3	UHF IF Amp.	6AU6	6AU6	7BK	
V4	RF Amplifier	6BK7A	6BK7A	9AJ	
V5	Converter	6U8	6U8	9EA	
V6	1st. Video IF Amp.	6CB6	6CB6	7CM	
V7	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V8	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V9	Video Output	12BY7	12BY7	9BF	
V10	AGC Keying-Vert. Mult.	12AX7	12AX7	9A	
V11	Sound Limiter	6AU6	6AU6	7BK	
V12	Audio Detector	6BN6	6BN6	7DF	
V13	Audio Output	6BK5	6BK5	9BQ	
V14	Sync Separator	6BE6	6BE6	7CH	
V15	Vert. Mult.-Vert. Output	6AH4GT	6AH4GT	8EL	
V16	Horiz. Phase Det.-Horiz. AFC	6AQ7GT	6AQ7GT	8CK	
V17	Horiz. Oscillator-Horiz. Discharge	6SN7GT	6SN7GT	8BD	
V18	Horiz. Output	6CD6G	6CD6G	5BT	
V19	Damper	6AX4GT	6AX4GT	4CG	
V20	HV Rectifier	1B3GT	1B3GT	3C	
V21	HV Rectifier	1X2A	1X2A	9Y	
V22	LV Rectifier	5U4G	5U4G	5T	
V23	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: ZENITH PART No.	SYLVANIA PART No.	GENERAL ELECTRIC PART No.	WESTINGHOUSE PART No.	RETMA BASE TYPE	NOTES
V24	21EP4B	21EP4B 21EP4A 21EP4 ① 21FP4 ① 21FP4A ①	21EP4B	21EP4B	12N 12N 12D 12M 12L	① Circuit changes necessary

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	■40	400	22-2437	AFH3-46		B048		FP378	TVL-4670	
B	▬80	400				BR3045		TC72		
C	▲30	400								
C2A	■40	400	22-2479	E4D641		C104		FP396.2	TVL-4805	
B	100	50				BR435		TC3501		
C	▬10	475								
D	▲4	350								
C3A	■4	350	22-2478	E3C466		B007			TVL-3603	
B	▲100	25				BR435				
C	40	25								
C4	4		22-2454							
C5	47		22-1667							
C6	400		22-2404							
C7	400		22-2404							
C8	10000		22-3	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C9	400		22-2404							
C10	400		22-2404							
C11	27		22-2509							
C12	800		22-2331	BPD-0008	DD-801	K069	801-001	DC-521	5HK-D1	
C13	1.2-3.5		22-2405							
C14	400		22-2404							
C15	800		22-2331	BPD-0008	DD-801	K069	801-001	DC-521	5HK-D1	
C16	400		22-2503							
C17	800		22-2331	BPD-0008	DD-801	K069	801-001	DC-521	5HK-D1	
C18	400		22-2404							
C19	1.8		22-2428							
C20	400		22-2404							
C21	470		22-2302	SI470	D6-471	TP46	GP2K-471	UC-5347	5GA-T47	
C22	400		22-2404							
C23	800		22-2331	BPD-0008	DD-801	K069	801-001	DC-521	5HK-D1	
C24	10000		22-3	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C25	10000		22-3	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C26	470		22-2217	SI470	D6-471	TP46	GP2K-471	UC-5347	5GA-T47	
C27	7									
C28	6		22-2381							
C29	9									
C30	24									
C31	1000		22-7	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C32	.47	200	22-2146	P288-47		CUB2P47		PT4047	2TM-P47	
C33	330		22-2309	SI330	D6-331	TP43	GP2K-331	UC-5333	5GA-T33	
C34	1000		22-7	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C35	1000		22-7	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C36	470		22-2302	SI470	D6-471	TP46	GP2K-471	UC-5347	5GA-T47	
C37	1000		22-7	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C38	470		22-6	BPD-00047	D6-471	K060	821-471	UC-5347	5GA-T47	
C39	1000		22-7	SI1000	D6-102	TP52	GP2L-102	UC-521	5HK-D1	
C40	560		22-2310	SI560	D6-561	TP48	GP2K-561	UC-5356	5GA-T56	
C41	470		22-2217	SI470	D6-471	TP46	GP2K-471	UC-5347	5GA-T47	
C42	4.5		22-2383							
C43	7		22-2375							
C44	270		22-2477	SI270	D6-271	TP47	GP2K-271	UC-5327	5GA-T27	
C45	47		22-2467	SI47N080			N080L-470			
C46	47		22-2325	SI47	D6-470	TP29	GP1K-470	UC-5447	5GA-047	

ZENITH MODELS L2259E, EU, R, RU, L2260R, RU, L2261E, EU, H, HU, L2266R, RU, L2267E, EU, H, HU, L2270, U, (Ch. 21L21), L2287R, RU (Ch. 21L21 & Radio Ch. 10L20)

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP	RATING VOLT	ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C47	.1	200	22-1777	P288-1	DF-104	CUB2P1		PT401	2TM-P1	
C48	.0033	600	22-2246	P888-0033	D8-332	CUB6D33	GP2-333-332	PT6233	6TM-D33	
C49	2000			BPD-002	DD-202	K072	801-002	DC-532	5HK-D2	
C50	3.3		22-2343	SI3.3NP0	TCZ-3.3	TZ06	NP0X-3R3	ZT-5533	5TCCB-V33	
C51	50		22-2460	SI50	D8-500	TP30	GP1K-500	UC-545	5GA-u5	
C52	1000		22-2276	BPD-001	DD-102	K069	801-001	DC-531	5HK-D1	
C53A	10000		22-2276	BPD-2X01	DD3-103	DK082	811-01	DCD-511	5HK-2S1	
B	10000						811-01			
C54	10		22-2378	SU10NP0	TCZ-10	Z018	NP0-S31-100	ZT-541	5TCC-Q1	
C55	.047	200	22-1778	P288-047	DF-503	CUB2S47		PT147	2TM-S47	
C56	10000		22-3	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C57	680		22-2320	SI680	D6-681	TP20	GP2K-681	UC-5368	5GA-T68	
C58	4000		22-4	BPD-004	D6-402	K078		DC-524	5HK-D4	
C59	.0047	600	22-1849	P888-0047	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C60	.0033	600	22-1776	P888-0033	D6-332	CUB6D33	GP2-333-332	PT6233	6TM-D33	
C61	.0022	600	22-1845	P888-0022	D6-222	CUB6D22	GP2-333-222	PT6222	6TM-D22	
C62	.1	600	22-1841	P888-1	DF-104	CUB6P1		PT601	6TM-P1	
C63	.001	600	22-2128	1464-001		1R5D1		MCB2S5	MB-31	
C64	.001	600	22-2128	1464-001		1R5D1		MCB2S6	MB-21	
C65	.015	200	22-2452	P888-015		CUB6S15		PT6115	6TM-S15	
C66	.0022	600	22-1814			1R5D22				
C67	.023	600	22-2129							
C68	.22	200	22-2167	P288-22		CUB2P22		PT4022	2TM-P22	
C69	56	500				22R5Q56				
C70	75	500	22-1256	1469-000075		22R5Q75		MCB230		
C71	.001	600	22-2127	P888-001	D6-102	CUB6D1	GP2L-102	PT631	6TM-D1	
C72	.0047	400	22-1842	1454-005		1R5D47		MCB2465	MB-25	
C73	.15	200	22-2166	P288-15		CUB2P15		PT4015	2TM-P15	
C74	.001	600	22-2127	P888-001	D6-102	CUB6D1	GP2L-102	PT631	6TM-D1	
C75	.1	200	22-1777	P288-1	DF-104	CUB2P1		PT401	2TM-P1	
C76	680	500	22-2125	1479-0007		1R5T68			MB-37	
C77	.0015	400	22-1785	1464-0015		1R5D15		MCB256		
C78	1000	500	22-2416			1R5D11				
C79	1000		22-2112							
C80	680		22-2387	1479-0007		1R5T68			MB-37	
C81	330		22-2309	1469-00035		1R5T33				
C82	.047	400	22-1775	P488-047	DF-503	CUB4S47		PT4147	4TM-S47	
C83	.0033	600	22-2246			[illegible]				
C84	.15	400	22-2341							
C85	.1	400	22-2340							
C86	.0068	400	22-2501							
C87	500	20000	22-1832	HV20C	TV3-502		413	HV20035A	20DK-T5	
C88	500	20000	22-1832	HV20C	TV3-502		413	HV20035A	20DK-T5	
C89	56	2000								

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	ZENITH PART No	IRC PART No	CLAROSTAT PART No	CENTRALAB PART No	MALLORY PART No	INSTALLATION NOTES
R1A	500KΩ	½	63-2911	QI3-133	AG-60-Z	AB-60	U-46	Volume
B	Shaft		Not Req.	C3	KSS-5	AK-4	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWB	KB-1	US-26	Attach to R1A
R2A	200KΩ	½	63-2837	QII-129	A47-200K-S	AB-46	U-43	Brightness
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R2A
R3A	7.5Meg with1Meg stop	½	[illegible]	QII-142		AB-89	U-82	Height - Note 1
B	Shaft		Not Req.	RQ		AK-1	Not Req.	Attach to R3A
R4	4000Ω	1	63-2159		39-4000			Vert. Range- wire wound
R5A	2500Ω	½	63-2834	QII-112	A47-3000-S	AB-7	U-8	Vert. Hold
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R5A
R6A	1500Ω	2	63-2812	WK-1500	A43-1500	VK-130	RI500L	Vert. Linearity - wire wound
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R6A
R7A	15KΩ	½	63-2854	QI7-115X				Contrast tapped at 10K
B	Shaft		Not Req.	WQ				Attach to R7A
R8	4000Ω	1	63-2159		39-4000			AGC - wire wound
R9	6000Ω	1	63-3167		39-600			Buzz- wire wound
R10A	7.5Meg	½	63-2805	QII-142	A47-7.5Meg-S	AB-89	U-82	Fringe lock
B	Shaft		Not Req.	[illegible]	FKS-1/4	AK-1	Not Req.	Attach to R10A
R11A	1Meg	½	63-2835	QII-137	A47-1Meg-S	AB-69	U-54	Tone
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R11A
R12	200Ω	½	63-2853					Screen register

Note 1. Connect a 1 Meg resistor in series with the left hand terminal. of the control & the lead connecting to the same terminal of the original control (control viewed from shaft end, terminals down.)

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	ZENITH PART No.	IRC PART No.	NOTES
R13	330Ω	½		BTS-3300	
R14	10KΩ	2	63-3176	BTB-10K	
R15	100KΩ	1		BTA-100K	
R16	470Ω	½		BTS-470	
R17	5500Ω	10			
R18	220KΩ	½		BTS-220K	
R19	47Ω	½		BTS-47	
R20	220KΩ	½		BTS-220K	
R21	47KΩ	½		BTS-47K	
R22	68KΩ	½		BTS-68K	
R23	470Ω	½		BTS-470	
R24	82Ω	½		BTS-82	
R25	82KΩ	½		BTS-82K	
R26	470Ω	½		BTS-470	
R27	100KΩ	½	63-1869	BTS-100K	
R28	100KΩ	½	63-1869	BTS-100K	
R29	220Ω	½	63-1757	BTS-220	
R30	68Ω	½	63-1727	BTS-68	
R31	2.2Meg	½	63-1926	BTB-2.2Meg	
R32	56Ω	½	63-1733	BTS-56	
R33	470Ω	½	63-1772	BTS-470	
R34	22KΩ	½	63-1841	BTS-22K	
R35	6800Ω	½	63-1821	BTS-6800	
R36	15Ω	½	63-1708	BTS-15K	
R37	10KΩ	½	63-1827	BTS-10K	
R38	120KΩ	½	63-1873	BTS-120K	
R39	120KΩ	½	63-1873	BTS-120K	
R40	470Ω	½	63-1772	BTS-470	
R41	220Ω	½	63-1757	BTS-220	
R42	150Ω	½		BTS-150	
R43	2200	2	63-1757	BTS-220	
R44	6200Ω	2		BTS-6200	
R45	22KΩ	½	63-1841	BTS-22K	
R46	27Ω	½	63-1719	BTS-27	
R47	10KΩ	2	63-3178	BTB-10K	
R48	100KΩ	½	63-1869	BTS-100K	
R49	22KΩ	½	63-1841	BTS-22K	
R50	3300Ω	4	63-2899		

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	ZENITH PART No.	IRC PART No.	NOTES
R51	3300Ω	4	63-2899		
R52	10KΩ	½	63-1827	BTS-10K	
R53	100KΩ	½	63-1869	BTS-100K	
R54	2700Ω	½	63-1823	BTS-2700	
R55	1000Ω	½	63-1785	BTS-1000	
R56	220KΩ	½	63-1883	BTS-220K	
R57	220KΩ	½	63-1883	BTS-220K	
R58	100KΩ	½	63-1869	BTS-100K	
R59	4700Ω	½	63-1813	BTS-4700	
R60	680KΩ	½	63-1904	BTS-680K	
R61	2700Ω	½	63-1803	BTS-2700	
R62	100KΩ	½	63-1869	BTA-100K	
R63	470KΩ	½	63-1896	BTS-470K	
R64	330Ω	1	63-3162	BTA-330	
R65	100KΩ	½	63-1869	BTS-100K	
R66	100KΩ	1	63-1869	BTA-100K	
R67	33KΩ	2	63-3180	BTB-33K	
R68	220KΩ	½	63-1883	BTS-220K	
R69	680Ω	½	63-1779	BTS-680	
R70	330KΩ	½	63-1890	BTS-330K	
R71	1000Ω	½	63-1788	BTS-1000	
R72	1000Ω	½	63-1743	BTS-100	
R73	10KΩ	½	63-1828	BTS-10K	Note 1
R74	470Ω	1	63-3896	BTA-470	
R75	680KΩ	½	63-1904	BTS-680K	
R76	1.5Meg	½	63-1918	BTS-1.5Meg	
R77	47KΩ	2	63-1157	BTB-47K	
R78	680KΩ	½	63-1904	BTS-680K	
R79	33KΩ	½	63-1848	BTS-33K	
R80	100KΩ	½	63-1869	BTS-100K	
R81	470KΩ	½	63-1896	BTS-470K	
R82	3.3Meg	½	63-1932	BTS-3.3Meg	
R83	180KΩ	½	63-1880	BTS-180K	
R84	150KΩ	½	63-1878	BTS-150K	
R85	22KΩ	½		BTS-22K	Note 2

ITEM No.	RATING OHMS	RATING WATT	ZENITH PART No.	IRC PART No.	NOTES
R86	100KΩ	½	63-1869	BTS-100K	
R87	47KΩ	½	63-1855	BTS-47K	
R88	100Ω	½	63-1744	BTS-100	
R89	1.8Meg	½	63-1922	BTS-1.8Meg	
R90	470Ω	1	63-3187	BTA-470	
R91	330Ω	1	63-2286	BTA-330	
R92	560Ω	½	63-1775	BTS-560	
R93	560Ω	½	63-1775	BTS-560	
R94	1Meg	½	63-1911	BTS-1Meg	
R95	1Meg	½	63-1911	BTS-1Meg	
R96	1Meg	½	63-1911	BTS-1Meg	
R97	27KΩ	½		BTS-27K	Note 3
R98	100Ω	½	63-1744	BTS-100	
R99	470Ω	½	63-1771	BTS-470	
R100	47KΩ	1	63-1194	BTA-47K	
R101	10KΩ	2	63-2145	BTB-10K	
R102	22KΩ	½	63-1842	BTS-22K	
R103	47KΩ	½	63-1856	BTS-47K	
R104	150KΩ	1	63-2130	BTA-150K	
R105	15KΩ	½	63-1834	BTS-15K	
R106	470KΩ	½		BTS-470K	
R107	100Ω	½	63-1744	BTS-100	
R108	22KΩ	1	63-2148	BTA-22K	
R109	150Ω	1	63-2284	BTA-150	
R110	68Ω	2	63-2808		
R111	15KΩ	2	63-1041	BTB-15K	
R112	15KΩ	2	63-942	BTB-15K	
R113	4700Ω	2	63-986	BTB-4700	
R114	4700Ω	2	63-986	BTB-4700	
R115	2.2Ω	½	63-2114		
R116	2.2Ω	½	63-2114		
R117	2.5Meg	½	63-2818	BTS-2.5Meg	
R118	47KΩ	½		BTS-47K	Note 4
R119	8.2Ω	½	63-2898		
R120	100KΩ	½	63-1870	BTS-100K	

Note 1. Used in combination sets only.
Note 2. Some Models may use a 15KΩ resistor in this application.
Note 3. Some Models may use a 47KΩ resistor in this application.
Note 4. Some Models may use a 33KΩ resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	RATING SEC. 4	RATING SEC. 5	ZENITH PART No	Stancor PART No	Merit PART No.	Triad PART No.	RCA TYPE No.	Halldorson PART No	Thordorson PART No.
T1	117VAC ②2A	518VCT ②.290ADC	5VAC ⑤6A				95-1311						
		12.6VCT ⑤5.5A											

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	ZENITH PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	RCA TYPE No.	Halldorson PART No.	Thordorson PART No.
T2	Horiz. Output Trans.	S-19033 S-19078 ①			DA-37① ④			
T3	Vert. Output Trans.	95-1361	A-8146					
T4A	Yoke-Horiz. (33MH)	95-1358	DY-8A	MDF-72	Y-17	211D2	DF502	
B	Yoke- Vert. (42MH)							
T5	Horiz. Lin.Coil (1.5-2MH)	S-19342	WC-7 ⑤	MWC-2 ⑤	WC-12 ①⑤	207R1 ①⑤		
T6A	Width Coils (4-20MH)	S-18768						
B	Width Coils (.6-2.4MH)							

① Windings only for horizontal output trans.
② See instruction sheet packed with unit for replacement procedure.
④ Drill new mounting hole.
⑤ Use original slider.
⑥ Connect to coded blue and green terminals.
⑧ Do not use tap.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	ZENITH PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordorson PART No.	NOTES
T7	6.8KΩ	3.6Ω	95-1339	A-3877①	A-3020	S-5Z	Z1003		① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	ZENITH PART No.	VIKING PART No.	QUAM PART No.	NOTES
SP1A	12"	PM	3.6Ω	49-740 ①	12211	12A6A	① Used in Model L2287R, L2287RU
B	10"	PM	3.6Ω	49-738	10211	10A31	② Alternate 10" PM speaker
				49-849 ②			

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	ZENITH PART No.	MEISSNER PART No.	MERIT PART No	MILLER PART No	NOTES
L1	UHF Ant. Coil Prt.	00CT		S-19683				
L3	UHF Ant. Coil Secondary	0Ω		30-426				
L3	UHF Mixer Coil	0Ω		30-426				
L4	Fil. Choke	.1Ω		30-425				
L5	Fil. Choke	0Ω						
L6	Fil. Choke	0Ω						
L7	Cathode Choke	0Ω		20-423				
L8	RF Choke	.1Ω		20-425				
L9	RF Choke	.1Ω		20-425				
L10	UHF Osc.Coil	0Ω		20-426				
L11	UHF Osc. Coupling Coil	0Ω		20-488				
L13	UHF IF Coupling	.5Ω		S-20535				
L13	Feedback Coil	3.3Ω		S-19641				
L14	RF Choke	.4Ω		S-20607				Wound on resistor
L18	RF Choke	.4Ω		S-20810				Wound on resistor
L16	UHF IF Output Coil	.2ΩCT		S-20908				
L17	IF Trap	0Ω		S-20503				Includes 100MMF cap.
L18	IF Trap	0Ω		S-20503				Includes 100MMF cap.
L19	Fil. Choke	0Ω		20-391				
L30	4L 25MC Trap	0Ω		S-19958				Includes core; core Part # 149-111
L31	47.25MC Trap	0Ω		S-19310		20-1047		Includes core; core Part # 149-111
L32	39.75MC Trap	0Ω		S-20290		20-1046		Includes core; core Part # 149-111
L33	1st Video IF	.1Ω		S-19736			[illegible]	Includes core; core Part # 149-110; coil shield & lug Part # [illegible]
L24	2nd Video IF	.1Ω	.1Ω	S-17907			6232 †	Includes core; core Part # 149-110; coil shield & lug Part # S-17916
L25	3rd Video IF	.1Ω	.1Ω	S-19952			6233 †	Includes core; core Part # 149-110; coil shield & lug Part # S-17916
L26	Fil. Choke	.1Ω		S-18894	19-1005		4612	9.6 Microhenries
L27	4th Video IF	.3Ω	.3Ω	S-19955				Part of video det. assembly.(Part # S-19956); # S-19956 includes L37, L38, L29, L30, crystal det. (Part # 103-4), C42 & C43)
L28	Series Peak. Coil	8.5Ω		S-19954	19-3180		4644	144 Microhenries
L29	Shunt Peak. Coil	8.5Ω		S-19953	19-3180 *	TV-184 *	4644 *	180 Microhenries, wound on 2700Ω resistor to [illegible]
L30	Series Peak. Coil	1.5Ω		S-18138	19-1005		4612	12 Microhenries
L31	RF Choke	1.5Ω		S-19969	19-3036	TV-180	6176	30 Microhenries
L32	Series Peak. Coil	6Ω		S-20021	19-4200	TV-184 *	6154 *	210 Microhenries; wound on 15KΩ resistor
L33	Shunt Peak. Coil	9.5Ω		S-17956	19-3500	TV-188	[illegible]	481 Microhenries
L34	1st Sound IF	3Ω	3.3Ω	S-19959				
L35	2nd Sound IF	.4Ω	.4Ω	S-20219	19-3445			See Note 1
L36	Quadrature Coil	4.8Ω		S-19001	20-1005			See Note 2
L37	Horiz. Osc.	100Ω		S-19742	19-1577			Tapped⑥ 65Ω; Note 3
L38	Anti-Ringing Coil	3Ω		S-20367	19-3180 ■	TV-184 ■	6180 ■	163 Microhenries; wound on 330Ω resistor

Note 1. Zenith Part # includes core; core Part # 149-96; coil shield & lug Part # S-19714.
Note 2. Zenith Part # includes core ; core Part # 149-110.
Note 3. Zenith Part # includes core; core Part # 149-131.
† Detune trap.
* Add 2700Ω resistor in series.
• Parallel with 15KΩ resistor.
■ Parallel with 330Ω resistor.

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 Ω)	ZENITH PART No.	Stancor PART No	Merit PART No	Triad PART No	Halldorson PART No	Thordorson PART No.
L39	.290ADC	82Ω	2.7 Hy.	95-1348			C-17X		

FUSES

ITEM No.	TYPE	RATING	ZENITH PART No. FUSE	ZENITH PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No FUSE	BUSS PART No HOLDER
M1	3AG S/B	1/4A 125V	136-22	85-1883	[illegible] (3AG S/B 1/4A)	357001	MDL 1/4	4405

PROPERTY OF L. F. [illegible] SHIP
5924 [illegible] ST.
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS (Continued)

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		ZENITH PART No.	SYLVANIA PART No.		
M2	CK710		1N82 or A		UHF Mixer
M3	1N64	103-1	1N132		Video Detector

MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M4	Dial Light	100-166	(2) used #47 Bayonet
M5	Tuner	S-19670	UHF
M6	Tuner	S-19970	VHF
M7	Switch	85-530	UHF-VHF changeover (2 DPDT type)
M8	Integrator	87-1	
M9	Focus Magnet	S-19661	Includes centering device
M10	Ion Trap	S-17461	
M11	Correction Magnet	S-19763	(2 Used)
B1	Trimmer Cap.	22-2398	Horiz. Drive
	Cabinet	14-1583E	Models L2259E, EU
	Cabinet	14-1583R	Models L2259R, RU
	Cabinet	14-1579R	Models L2260R, RU
	Cabinet	14-1584E	Models L2261E, EU
	Cabinet	14-1584H	Models L2261H, HU
	Cabinet	14-1582R	Models L2266R, RU
	Cabinet	14-1578E	Models L2267E, EU
	Cabinet	14-1578H	Models L2267H, HU
	Cabinet	14-1585	Models L2270, U
	Cabinet	14-1580R	Models L2287R, RU
	Scale	26-508	Channel Indicator } Part of S-20328
	Disc	27-190	Channel Indicator } (E, EU Models only)
	Knob	46-1005	Brightness & vert. hold
	Knob	46-1008	Control cover (E, EU Models only)
	Knob	46-1052	Fine tuning
	Knob	46-1118	Horiz. Hold
	Knob	46-1120	Screen reg. & tone (E, EU Models only)
	Knob	S-20328	Channel Selector (E, EU Models)
	Knob	46-1197	Volume (E, EU Models)
	Knob	46-1199	Contrast
	Scale	26-508	Channel Selector } Part of S-20277
	Disc	27-190	Channel Selector }
	Knob	46-1006	Control Cover
	Knob	46-1119	Screen register & tone } Models H, HU,
	Knob	S-20277	Channel Selector } R, RU, L2270, U
	Knob	46-1196	Volume
	Safety Glass	192-52	L2259 Models
	Safety Glass	192-152	L2261 Models
	Safety Glass	192-161	L2260, L2266 , L2267, L2270, L2287 Models

TROUBLE SHOOTING AIDS (cont)

PROPERTY OF
L. F. CLANTENSHIP
2024 MEADE ST.
DENVER, COLORADO

POWER

DEAD SET

If filaments fail to light, check AC interlock assembly switch on volume control and T1. If filaments light, substitute V22 and V23. Check B+ filter and decoupling network components.

SMALL AND/OR DIM PICTURE

Substitute V22 and V23. Check B+ filter and decoupling network components.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check fuse M1. Check by substitution V17, V18, V19, V20 and V21. Check waveform W18.

If Satisfactory	If Unsatisfactory
Check R117, R116, R115, C88, C87, T 2, T4A and other associated components.	Check C81, R106, R104 and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V17, V18, V19, V20, V21, V22 and V23. Check picture tube. Proceed as outlined under "Loss of High Voltage".

BLOOMING

Check by substitution V17, V18, V19, V20, V21, V22 and V23. Check R113, R114, R115, C87, C88, T2, T4A, C82, R109, R110 and other associated circuit components for failure or change of value.

GENERAL

RASTER SOUND NO PICTURE

Follow procedure outlined under "Loss of Video".

RASTER PICTURE NO SOUND

Follow procedure outlined under "Weak or No Sound".

RASTER NO PICTURE NO SOUND

Check V4, V5, V6, V7, V8 and V9 by substitution. Check associated circuit components. Check video detector assembly. In case of UHF check V1, V2 and V3.

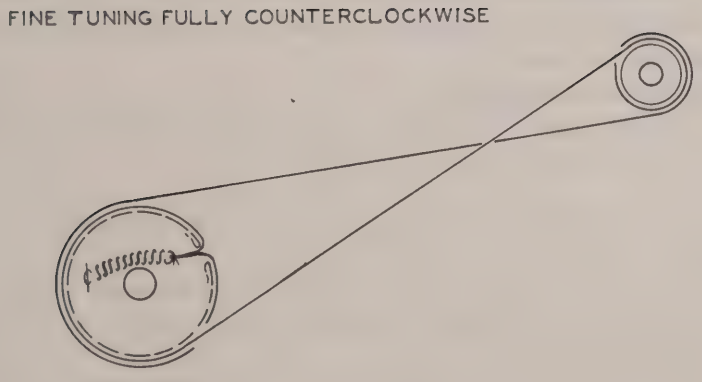
KEYSTONE EFFECT

Check T4, C89, R92 and R93.

INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing. Check video signal for interference pulses.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.



FINE TUNING DRIVE CORD STRINGING

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF tuner oscillator circuit. Remove rear cover supply power to set. Adjustments are made thru the hole marked "Bull's Eye Adjustment" and are accessible one at a time as the selector switch is turned to each channel (Fine tuning control must be set to its center of its range before making adjustments). Use alignment wrench 68-21 for adjustments.

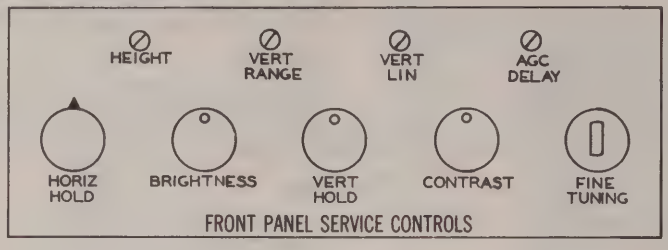
PICTURE TUBE SAFETY GLASS CLEANING

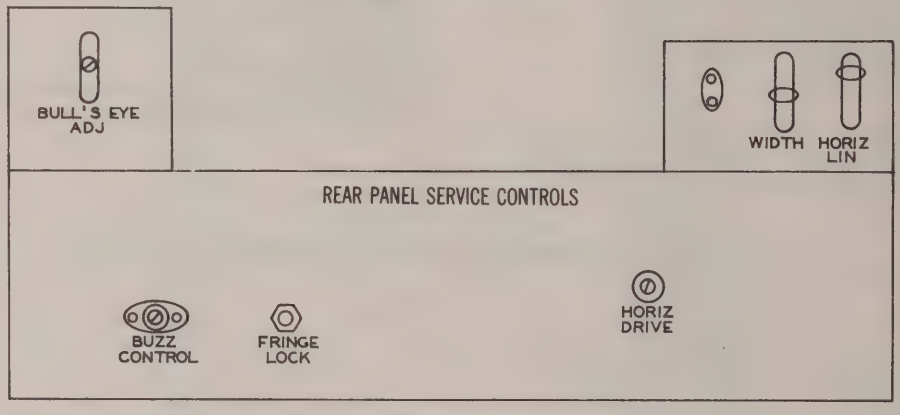
For picture tube safety glass cleaning, it is necessary to remove chassis. (See disassembly instructions).

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION





SPECIAL ADJUSTMENTS - AGC DELAY ADJUSTMENT

Turn the set on and tune in a TV signal and observe the picture. Starting from the full clockwise position turn the AGC delay control slowly counter clockwise until picture distorts and buzz is heard in the sound. Then turn control clockwise for clearest picture and best sound.

FRINGE LOCK ADJUSTMENT

Turn the fringe lock control to 1/4 turn from full clockwise position. Adjust the vertical and horizontal hold for picture synchronization and check stability by switching off channel and back again.

Slightly retouch the fringe lock control adjustment, if necessary, for maximum stability while testing as above.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horizontal oscillator circuit can be made from the front panel service control. Adjust the horizontal hold control (L37) until picture synchronizes horizontally. If results cannot be obtained see horizontal sweep circuit adjustments on page 11.

SOUND IF DETECTOR BUZZ ADJUSTMENT

Adjust the buzz control located on the rear apron of the chassis for maximum volume and minimum buzz. If results are unsatisfactory see alignment instructions on pages 6 and 7.

FUSES

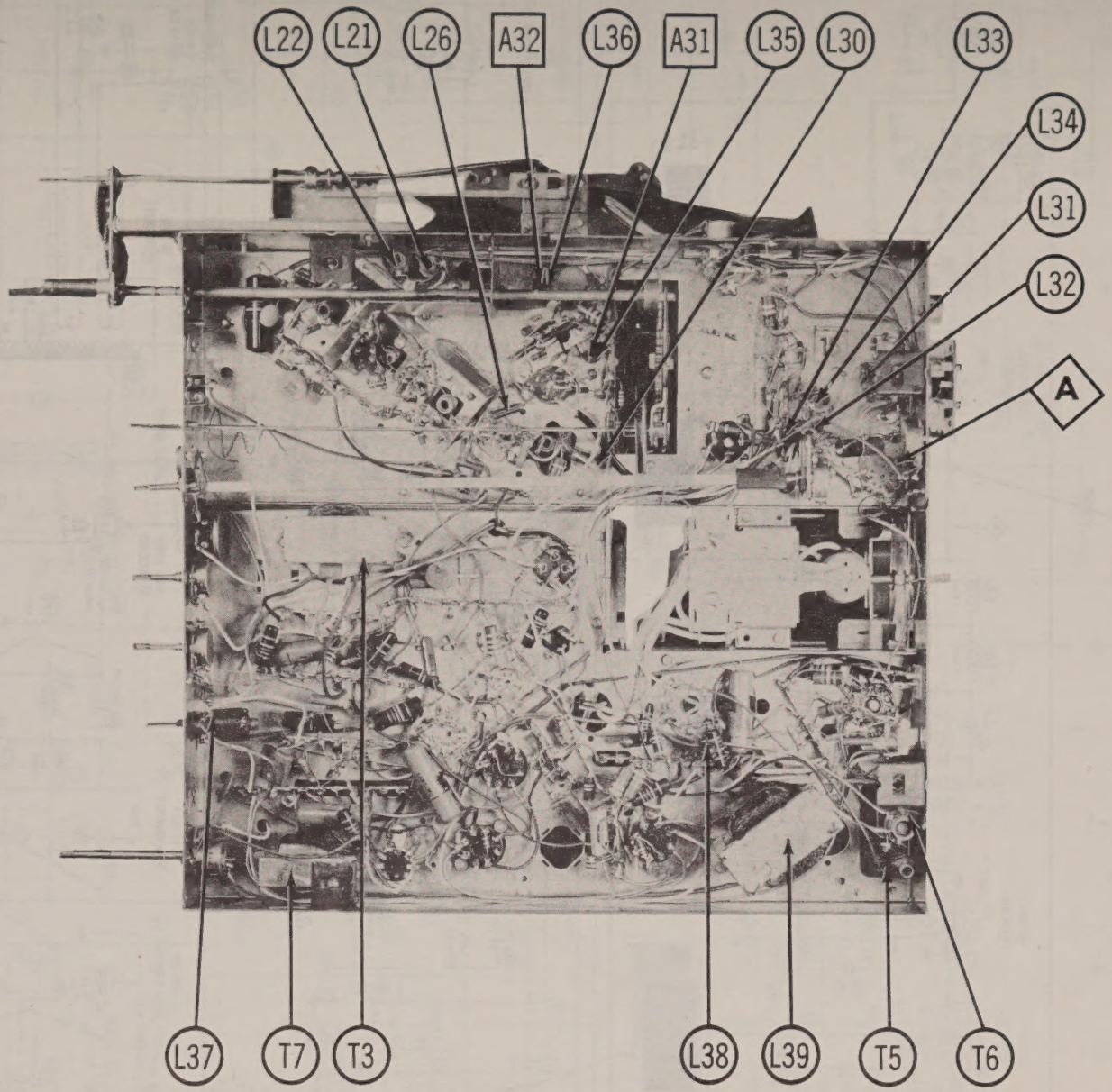
One fuse is used for horizontal sweep circuits protection. (For location, see tube placement chart).

CENTERING

Centering is accomplished mechanically by means of a centering lever on the PM focusing assembly. Adjust the centering lever from side to side, and up and down until the picture is properly centered.

ANTI-PIN CUSHION ADJUSTMENT

Adjust the vertical height and horizontal width controls so that the corners and sides of the raster are visible. Bend the corrector magnets arms for right angle corners and until opposite sides of the picture are straight and parallel. Restore picture to normal size.



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

PROPERTY
L. F. BLANKEN
3924 MEADE ST